

**DRAFT  
FINAL REPORT**

Prepared for:



# PEÑA BOULEVARD CORRIDOR

## TRANSPORTATION STUDY

SEPTEMBER 2017

Prepared by:

**URS**

URS Corporation,  
an AECOM Company  
Denver, Colorado



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## **Draft Final Report**

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**Prepared by:**



**URS Corporation, an AECOM Company  
Denver, Colorado**

**in association with**

**Cambridge Systematics  
Communications Infrastructure Group  
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# 1. Introduction

## 1.1 Purpose

### 1.1.1 Project Overview

The Peña Boulevard/Tower Road Corridor is a major north-south roadway transportation link for the northeast Denver metropolitan area, connecting rapidly growing communities in northern Adams County (including Brighton and Commerce City) with Denver and Aurora.

Peña Boulevard is a private roadway that was constructed for the purpose of providing access to and from Denver International Airport (DEN). DEN received and continues to receive federal grant funding from the Federal Aviation Administration (FAA) and to accept those grants, DEN has agreed to many formal obligations and assurances.

As the development in the vicinity of the Airport has grown, Peña Boulevard has become more congested and expansion of Peña Boulevard and/or other roadways will be required in the foreseeable future to accommodate the increasing vehicular traffic demand. The FAA has expressed concern to DEN about the increasing volume of non-airport traffic that is using Peña Boulevard. Expenditures for capital improvements and maintenance necessitated by non-airport traffic create a “diversion of Airport revenue” from aviation related activities and could potentially put DEN in non-compliance with FAA grant assurances.

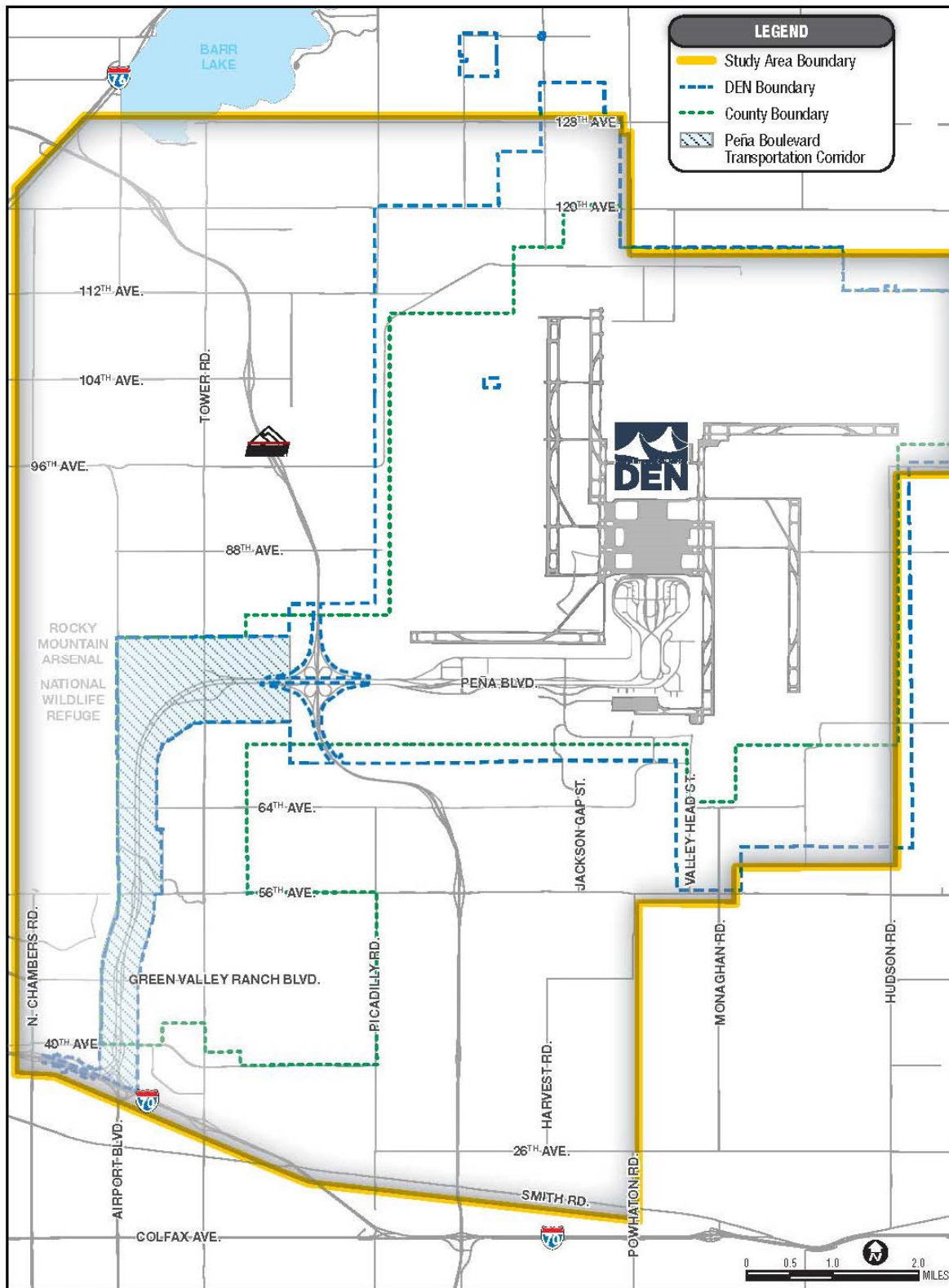
The Peña Boulevard Corridor Transportation Study was tasked with identifying alternatives and solutions to the FAA compliance problem for Peña Boulevard – now and in the future. The initial goals and objectives for this study include:

- Find a solution for Peña Boulevard that will satisfy the Airport’s FAA grant obligations while ensuring continued access and capacity for Airport use.
- Work with stakeholders to develop consensus-driven long-term solutions that are financially feasible and equitable.
- Coordinate with other ongoing studies regarding DEN and Aerotropolis.
- Implement a work scope that is collaborative and transparent in its development and evaluation.
- Provide the Mayor of Denver with a recommended solution that will be supported by the FAA and the other stakeholders.

### 1.1.2 Study Area

As shown on Figure 1-1, the study area is bounded by 128<sup>th</sup> Avenue to the north, Powhaton Road to the east, I-70/Smith Road to the south, and Chambers Road to the west.

**Figure 1-1**  
**Study Area**



Source: URS 2016

## 2. Corridor Land Use

### 2.1 Land Use Overview

The study area lies within both Denver and Adams Counties. In addition, portions of the cities of Denver, Aurora, and Commerce City lie within the study area.

Numerous metropolitan districts exist in the study area. Table 2-1 presents the study area metropolitan districts. The boundaries of the jurisdictions and metropolitan districts within the study area are presented on Figure 2-1.

**Table 2-1**  
**Study Area Metropolitan Districts**

Denver County		Adams County	
1.	Denver Gateway Center	11.	Commerce City Northern Infrastructure Improvement
2.	Denver Gateway Meadows	12.	First Creek Ranch
3.	Denver High Point at DIA	13.	Second Creek Ranch
4.	Denver International Business Center No. 1	14.	Third Creek
5.	Ebert		
6.	First Creek		
7.	Gateway Regional		
8.	Green Valley Ranch		
9.	Sand Creek		
10.	Town Center		

Sources: City and County of Denver, Adams County, City of Aurora

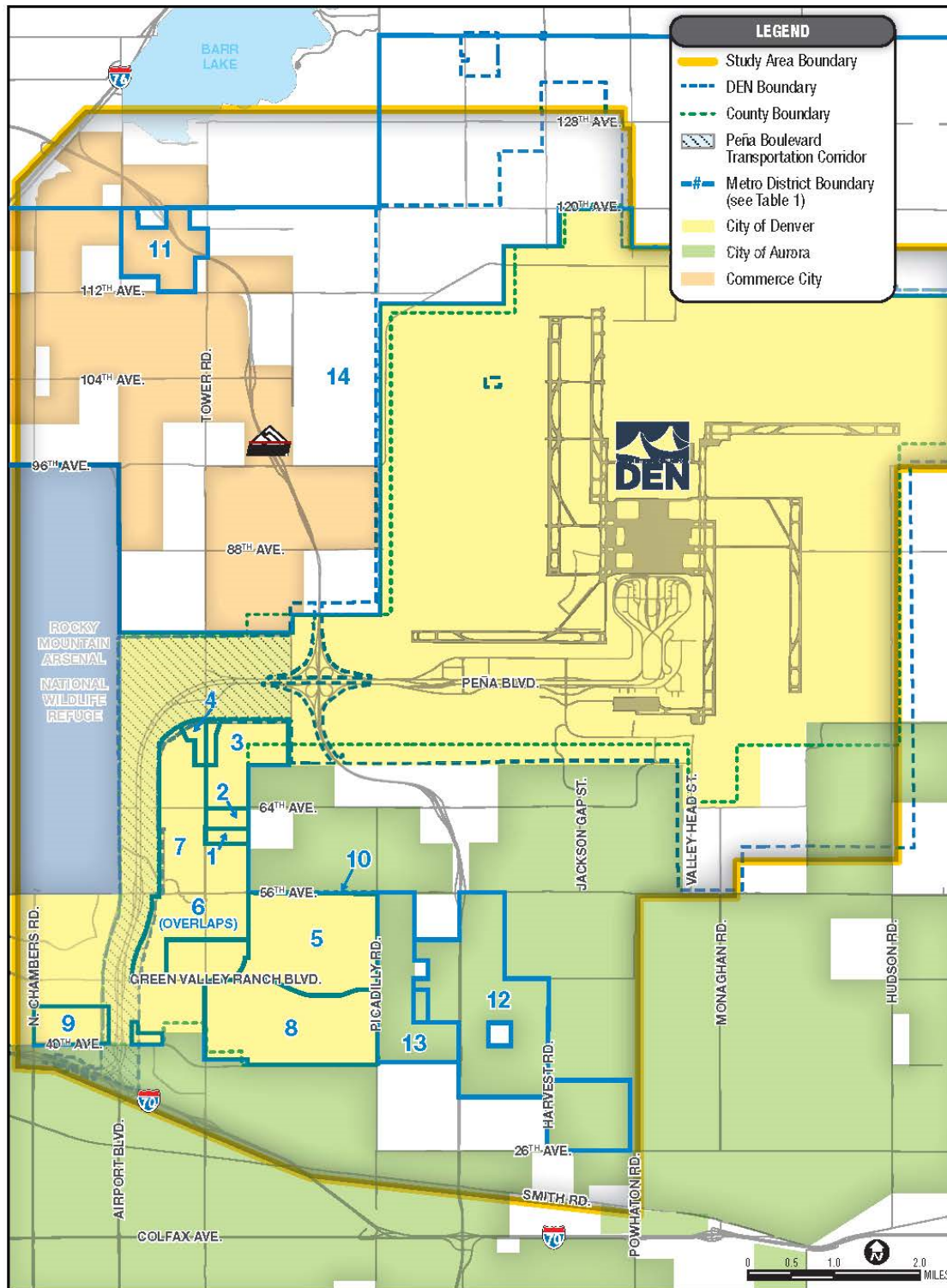
Figure 2-2 depicts the generalized land uses within the study area. Airport related land uses are generally located within the DEN boundary as well as along Tower Road in the vicinity of Peña Boulevard. Residential areas in Denver and Aurora are located south of 64<sup>th</sup> Avenue and west of Picadilly Road. Commerce City residential areas are located north of 96<sup>th</sup> Avenue and west of Tower Road.

Commercial areas are mixed throughout the study area. The land east of Picadilly Road and E-470 is primarily agricultural in nature. West of Peña Boulevard between 56<sup>th</sup> Avenue and 96<sup>th</sup> Avenue is the Rocky Mountain Arsenal National Wildlife Refuge.

Land uses within the Peña Boulevard Transportation Corridor are defined and predicated on the 1988 Denver-Adams County “Intergovernmental Agreement on the New Airport (the “IGA”). These uses include (1) a scenic buffer, which is a strip of land extending 1,000 feet on each side from the centerline of Peña Boulevard, which shall be preserved as open space, and (2) a transportation corridor that comprises real property within the boundaries established in the IGA.

The IGA also establishes restrictions on development. Residential, commercial and industrial development shall be permitted in the Transportation Corridor only south of 72<sup>nd</sup> Avenue and south and east of the scenic buffer. The IGA tasks the City and County of Denver with taking whatever steps are necessary to ensure that no residential, commercial, or industrial development occurs in the Transportation Corridor north or west of, or within, the Scenic Buffer.

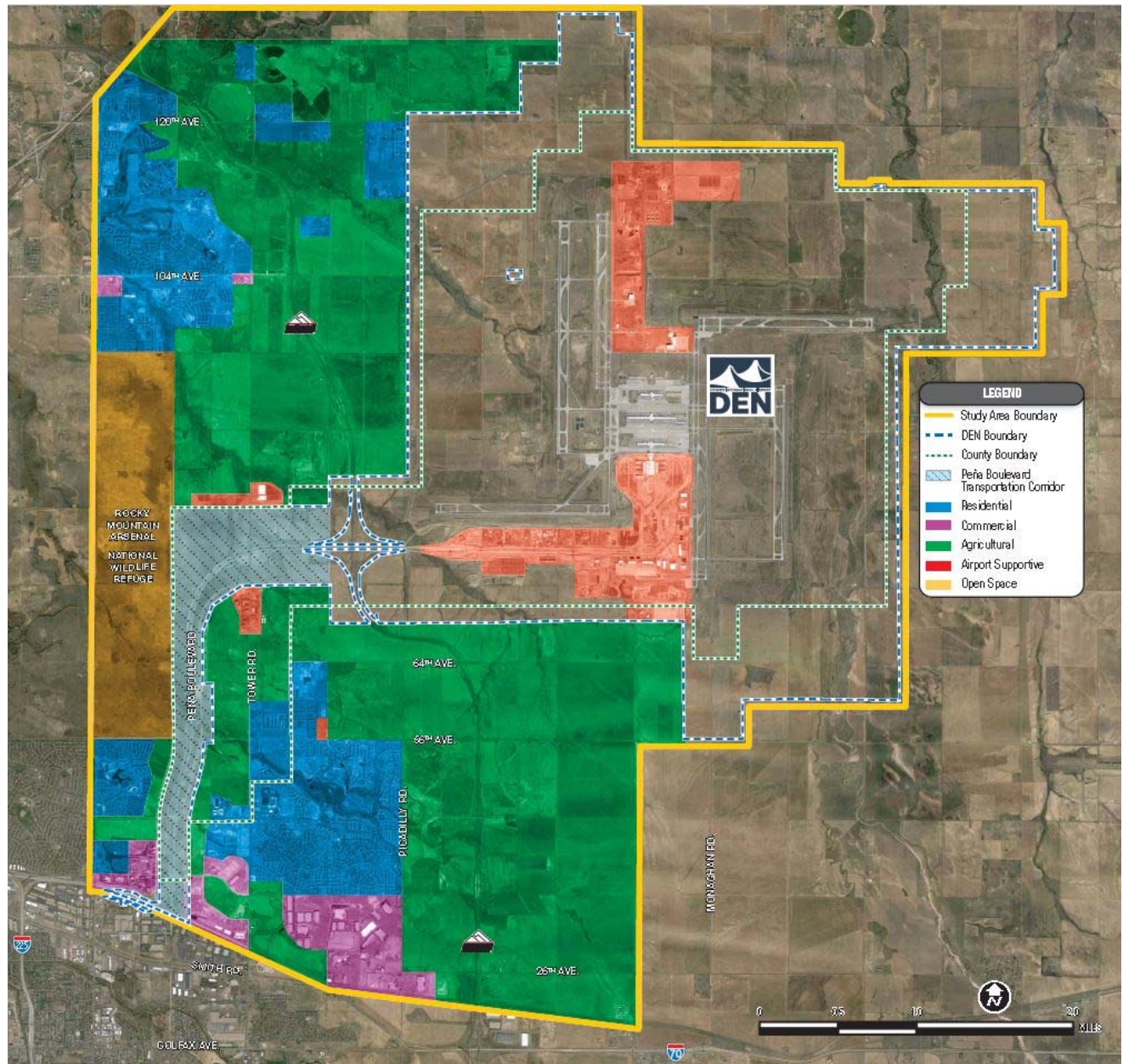
**Figure 2-1**  
**Jurisdictional and Metro District Boundaries**





In November 2015, Denver and Adams County voter passed a ballot measure amending the 1988 IGA. Key elements of the amendment included allowing for 1500 acres of non-aeronautical commercial development on DEN land on the main airport site and in the Peña Boulevard Transportation Corridor north of 72<sup>nd</sup> Avenue, sharing with Adams County one-half of the available tax revenue derived by Denver from such development, and promoting economic development and job creation in and around DEN in both Denver and Adams County.

**Figure 2-2**  
**Study Area Existing Land Uses**



Source: URS, 2016

Historically, the land within the study area has been used for agriculture. Since the opening of DEN in 1995, residential and commercial developments have increased within the study area, primarily within the cities of Denver, Aurora, and Commerce City. Land development began in the western portion of the study area and has extended east over time. To date, almost all new development has remained west of the E-470 corridor.

The majority of land development has been residential in nature; the largest development being Green Valley Ranch, which is located south of 56<sup>th</sup> Avenue between Tower Road and Picadilly Road within the City and County of Denver. Commerce City has also established residential areas north of 96<sup>th</sup> Avenue and west of Tower Road, within the Reunion development.

The majority of commercial land uses have been established south of 40<sup>th</sup> Avenue between Tower Road and Picadilly Road. A small area of Airport related commercial uses, primarily hotels, restaurants, and off-site long-term airport parking, is located on Tower Road near the interchange with Peña Boulevard.

## 2.2 Sensitive Environmental Resources

The East Corridor Commuter Rail Final Environmental Impact Statement (FEIS) prepared in September 2009 by the Denver Regional Transportation District (RTD) included a detailed investigation of all resources within the commuter rail corridor, which parallels Peña Boulevard. The FEIS has been revised and updated due to the addition of the stop and platform at 61<sup>st</sup> and Peña through a re-evaluation of the FEIS. Minor revisions were noted as part of the mitigation section of the re-evaluation. The following narrative extracts resource information from the FEIS that is specific to the immediate Peña Boulevard corridor.

### 2.2.1 Historic Resources

There is one identified historic resource within the Peña Boulevard corridor. The Derby Lateral (High Line Canal Lateral A Extension/Segment), also known as the “Doherty Ditch” crosses the corridor in the vicinity of the Green Valley Ranch Boulevard interchange. The lateral varies between 20 and 30 feet in width. It is eligible to be listed in the National Register of Historic Places.

### 2.2.2 Archaeological and Paleontological Resources

There are no known archaeological resources identified within the Peña Boulevard corridor.

### 2.2.3 Parklands and Recreation Areas

Four multi-use recreational trails are proposed to cross the Peña Boulevard corridor, including Derby Lateral, First Creek (recently constructed), Second Creek and E-470. In addition, the Peña Boulevard trail is proposed to parallel the west side of Peña Boulevard from 40<sup>th</sup> Avenue to E-470.

### 2.2.4 Biological Resources

The Peña Boulevard corridor consists of grassland, most of which is maintained. Based on study field observations, wildlife in the area consists mainly of small mammals such as mice, prairie dogs and coyotes. No critical or essential wildlife habitat was identified. It is unlikely that large animals such as deer would occupy the area adjacent to a major freeway for long periods of time.

The Rocky Mountain Arsenal National Wildlife Refuge (RMANWR) is adjacent to and west of the Peña Boulevard corridor between 56<sup>th</sup> Avenue and 96<sup>th</sup> Avenue. The RMANWR includes small patches of relatively undisturbed native prairie, wooded areas, and wetlands. There is one known bald eagle nest at the RMANWR. Eagles are known to use the area for winter roosting.

Prairie dogs inhabit the Peña Boulevard corridor. As a result, it is likely that burrowing owls are also present in the corridor. The Preble's Meadow Jumping Mouse may also be present in the corridor. However, the majority of the corridor is located within the Preble's mouse block clearance zone, which exempts the area from further review from the US Fish and Wildlife Service. The Second and Third Creek corridors are the two locations that do not lie within the clearance zone.

### 2.2.5 Natural Resources

Several floodplain and detention pond resources are located within the Peña Boulevard corridor. The corridor crosses the Derby Lateral, First Creek, Second Creek and Third Creek floodplains. Detention ponds are located within the corridor right-of-way including: Silverado I, Silverado II, High Line, Local, and High Point. In addition, the Dogwood and Blue Grama detention ponds are planned within the corridor. As a result of several water bodies and linear drainages within the corridor, wetlands may exist in localized areas throughout the Peña Boulevard corridor.

### 2.2.6 Hazardous Materials

There are no Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites within the Peña Boulevard corridor. The closest National Priority List Site is the RMANWR. There are however, multiple leaking underground storage tanks (LUST) sites within the Peña Boulevard corridor. These sites are located east of E-470 in the vicinity of the rental car agencies and the Conoco Phillips gas station at DEN. There are no identified hazardous material sites within the Peña Boulevard corridor west and south of E-470.

## 2.3 Existing Planning Documents

Numerous studies have been conducted for projects within the Peña Boulevard study area. These studies as well as other materials relating to the project study area have been provided to the URS team for reference and guidance during the study. A short description of each study and work product is provided in Appendix A to this report.



## 3. Study Area Infrastructure

### 3.1 Overview

The transportation infrastructure within the study area includes roadways, transit facilities, trails, major drainage corridors, and regional detention ponds. This section will identify and describe the characteristics of the existing transportation infrastructure, establishing the baseline from which future proposed scenarios will be developed.

### 3.2 Roadways

The study area has numerous roadway facilities that provide access throughout the area. The study area includes three high-speed limited-access highways, as well as numerous arterial corridors. Figure 3-1 depicts the roadway infrastructure within the study area. Each major roadway within the study area is described below.

#### 3.2.1 Peña Boulevard

Peña Boulevard is the primary access route to DEN. It is a four-lane freeway that extends from I-70 in the southwest corner of the study area to Jeppesen Terminal at DEN. The roadway widens to three lanes in each direction between E-470 and the Airport terminal. Peña Boulevard is approximately 12 miles in length. The majority of the corridor has a posted 65 miles per hour (mph) speed limit, reducing to 55 mph and below as the roadway approaches the terminal area of the Airport.

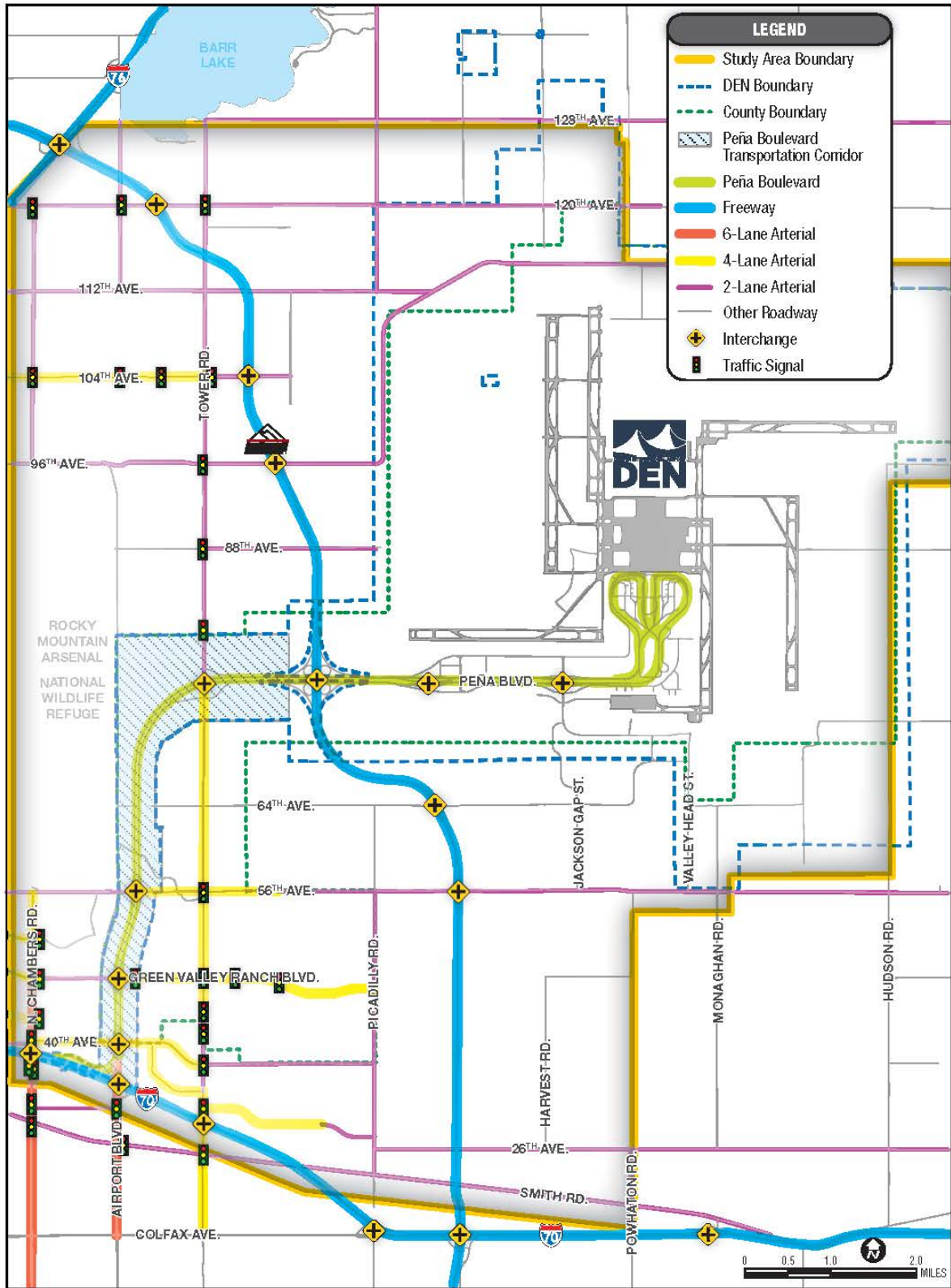
The freeway provides seven full or partial interchanges at 40<sup>th</sup> Avenue, Green Valley Ranch Boulevard, 56<sup>th</sup> Avenue, Tower Road, E-470, Gun Club Road and Jackson Gap Street. The latter two interchanges are located within DEN, providing access to on-site long-term parking, rental car concessions, and the cell phone waiting concession. A partial interchange is located at Tower Road—only three access ramps are provided at this location, the westbound/southbound on-ramp from Tower Road to Peña Boulevard is under design.

#### 3.2.2 E-470 Tollway

E-470 is a limited access tolled freeway that encompasses the eastern half of the Denver metro area. The freeway extends from I-25 north of the metro area to I-25 south of the metro area. The roadway is approximately forty-seven miles in length. The majority of the corridor has a posted 75 mph speed limit, reducing to lower speeds in the vicinity of I-25 and I-70. The roadway provides access to DEN primarily for passengers north or east of Denver who use I-25, I-76 and I-70 to access DEN.

In the study area, E-470 has four lanes and includes a full cloverleaf interchange with Peña Boulevard directly west of DEN. The interchange provides access to/from both directions of Peña Boulevard. The interchange is approximately seven miles from I-70, seven miles from I-76 and 15 miles from I-25 (north).

**Figure 3-1**  
**Roadway Infrastructure**



Source: URS 2016

### 3.2.3 Interstate 70 (I-70)

Interstate 70 is a four-lane freeway that provides east-west access across the Denver metro area. It provides the primary access to the southern terminus of the Peña Boulevard corridor. The majority of the greater Denver metropolitan airport traffic travels eastbound on I-70 to Peña Boulevard. I-70 has a 55 mph posted speed limit within the study area. Approximately three miles of the freeway are included within the study area. Full access interchanges are provided at Chambers Road, Airport Boulevard, and Tower Road. The interchange with Peña Boulevard is directional in nature, providing access only to/from the west on I-70.

### 3.2.4 Chambers Road

Chambers Road is a four- to six-lane, median-divided arterial street that provides north-south access between I-70 and 56<sup>th</sup> Avenue. A second two-lane section provides access from 96<sup>th</sup> Avenue to 120<sup>th</sup> Avenue. The corridor is discontinuous from 56<sup>th</sup> Avenue to 96<sup>th</sup> Avenue because of the Rocky Mountain Arsenal National Wildlife Refuge. The roadway represents the western boundary of the project study area and runs parallel to Peña Boulevard.

The southern section of Chambers Road has a posted 40 mph speed limit. Signalized intersections are located at 53<sup>rd</sup> Avenue, Green Valley Ranch Boulevard, 46<sup>th</sup> Avenue, 40<sup>th</sup> Avenue, and the I-70 ramps. The northern section of Chambers Road has a posted 40 mph speed limit. Signalized intersections are located at 104<sup>th</sup> Avenue and 120<sup>th</sup> Avenue.

### 3.2.5 Airport Boulevard

Airport Boulevard is a six-lane, median-divided arterial street that provides north-south access between Smith Road and 40<sup>th</sup> Avenue within the study area. The roadway extends directly south of Peña Boulevard and provides access to Peña Boulevard at 40<sup>th</sup> Avenue. The roadway also has a full access interchange with I-70 immediately south of its access to Peña Boulevard.

Airport Boulevard has a posted speed limit of 40 mph. Signalized intersections are located at I-70, 32<sup>nd</sup> Avenue, and Smith Road.

### 3.2.6 Tower Road

Tower Road is an arterial street that provides north-south access across the entire length of the study area from Smith Road to 128<sup>th</sup> Avenue. From Smith Road to 38<sup>th</sup> Avenue the roadway is a four-lane, median-divided street. From 38<sup>th</sup> Avenue to 45<sup>th</sup> Avenue, the roadway is two lanes with no median. From 45<sup>th</sup> Avenue to just south of Peña Boulevard (72<sup>nd</sup> Avenue), the roadway widens back to a four-lane, median-divided roadway. From just north of Peña Boulevard (80<sup>th</sup> Avenue), Tower Road is a two-lane roadway, note as of the writing of this report Commerce City is widening Tower Road from two lanes to four lanes from 80<sup>th</sup> Avenue to 103<sup>rd</sup> Avenue. Tower Road has a three-quarter interchange with Peña Boulevard, providing full access to the east, but only partial access to the west. There is no westbound/southbound on-ramp provided from Tower Road to Peña Boulevard. Furthermore, as of the writing of this report Commerce City is in the process of designing the eastbound on-ramp at Tower Road/Peña Boulevard interchange, with construction scheduled to start Fall 2017. In addition, City and County of Denver Public Works is funding Commerce City to design and build the widening of Tower Road through the Peña corridor to four lanes.

Tower Road has a posted speed limit of 40 mph from Smith Road to Green Valley Ranch Boulevard. The speed limit increases to 45 mph from Green Valley Ranch Boulevard to 81<sup>st</sup> Avenue. North of 81<sup>st</sup> Avenue the speed limit increases to 50 mph. North of 120<sup>th</sup> Avenue the speed limit increases to 55 mph. Signalized intersections are located at Smith Road, I-70, 32<sup>nd</sup> Parkway, 35<sup>th</sup> Avenue, 38<sup>th</sup> Avenue, 43<sup>rd</sup>



Avenue, 45<sup>th</sup> Avenue, Green Valley Ranch Boulevard, 56<sup>th</sup> Avenue, Peña Boulevard, 81<sup>st</sup> Avenue, 88<sup>th</sup> Avenue, 96<sup>th</sup> Avenue, 104<sup>th</sup> Avenue, and 120<sup>th</sup> Avenue.

### 3.2.7 Picadilly Road

Picadilly Road is a two-lane north-south arterial street that provides access between Smith Road and 56<sup>th</sup> Avenue. It does not provide access to Peña Boulevard, but rather runs parallel to it. Picadilly Road has a posted speed limit of 35 mph. There are no signalized intersections along Picadilly Road.

### 3.2.8 Green Valley Ranch Boulevard

Green Valley Ranch Boulevard is an arterial that extends from Chambers Road to Picadilly Road on the 48<sup>th</sup> Avenue alignment. It is a two-lane roadway from Chambers Road to Peña Boulevard and a four-lane road from Peña Boulevard to Picadilly Road. Green Valley Ranch Boulevard has a full access interchange with Peña Boulevard.

Green Valley Ranch Boulevard has a posted speed limit of 40 mph from Chambers Road to Tower Road. East of Tower Road the speed limit reduces to 35 mph. Signalized intersections are located at Chambers Road, Peña Boulevard, Telluride Street, Tower Road, Argonne Street, and Himalaya Road.

### 3.2.9 40<sup>th</sup> Avenue

40<sup>th</sup> Avenue is a four-lane arterial street that extends between Chambers Road and Himalaya Road at the southern end of Peña Boulevard. The roadway terminates at Himalaya Road (as 38<sup>th</sup> Avenue). The roadway has a full access interchange with Peña Boulevard. The 40<sup>th</sup> Avenue/Airport RTD park-n-Ride is accessible from 40<sup>th</sup> Avenue at Salida Street.

The posted speed limit is 40 mph. Signalized intersections are provided at Chambers Road, Kittredge Street, Peña Boulevard, and Tower Road.

### 3.2.10 56<sup>th</sup> Avenue

56<sup>th</sup> Avenue is an east-west arterial road that extends from Chambers Road through the entire study area to Imboden Road east of DEN. 56<sup>th</sup> Avenue marks the southern edge of the Rocky Mountain Arsenal National Wildlife Refuge. From Chambers Road to Peña Boulevard, 56<sup>th</sup> Avenue is two lanes. The roadway widens to a four-lane median divided facility from Peña Boulevard to Ireland Street. East of Ireland Street the facility narrows back to two lanes. 56<sup>th</sup> Avenue has a full access interchange with Peña Boulevard. The roadway also has a full access interchange with E-470.

56<sup>th</sup> Avenue provides the primary access route between DEN and Front Range Airport, which is located approximately five miles to the southeast. The roadway also provides access to the south side of DEN via Jackson Gap Street and Valley Head Street. 56<sup>th</sup> Avenue has a posted speed limit of 45 mph from Chambers Road to Imboden Road. Signalized intersections are located at Peña Boulevard and Tower Road.

### 3.2.11 96<sup>th</sup> Avenue

96<sup>th</sup> Avenue is a two-lane east-west arterial that marks the northern edge of the Rocky Mountain Arsenal National Wildlife Refuge. The roadway is accessible from Tower Road and Buckley Road. The street has a posted speed limit of 45 mph. The Tower Road/96<sup>th</sup> Avenue intersection is signalized. 96<sup>th</sup> Avenue east of Tower Road provides access to the DEN internal roadway network and the North Airfield Area.

### 3.2.12 104<sup>th</sup> Avenue

104<sup>th</sup> Avenue is a four-lane east-west arterial between Chambers Road and Tower Road. East of Tower Road the roadway reduces to two lanes and terminates just east of the E-470 interchange ramps. The roadway does not provide access to Peña Boulevard but provides a full access interchange at E-470.

The posted speed limit on 104<sup>th</sup> Avenue is 45 mph. Signalized intersections are located at Tower Road, Reunion Parkway, Landmark Drive, and Chambers Road.

### 3.2.13 120<sup>th</sup> Avenue

120<sup>th</sup> Avenue is primarily a two-lane arterial roadway that extends through the entire study area from Chambers Road east to Imboden Road east of DEN. The roadway does not provide access to Peña Boulevard but has a full access interchange with E-470. 120<sup>th</sup> Avenue provides access to the DEN interior roadway network, North Airfield and Fuel Farm via Trussville Street.

The posted speed limit is 45 mph. Signalized intersections are provided at Chambers Road, Buckley Road, and Tower Road.

### 3.2.14 Buckley Road

Buckley Road is former roadway that was vacated from 56<sup>th</sup> Avenue north to 96<sup>th</sup> Avenue. A section of abandoned roadway that extends between 56<sup>th</sup> Avenue and 80<sup>th</sup> Avenue lies within Federal lands on the Rocky Mountain Arsenal National Wildlife Refuge. Between 80<sup>th</sup> Avenue and 96<sup>th</sup> Avenue, the vacant right-of-way is available for use.

## 3.3 Transit

The Regional Transportation District (RTD) provides transit service within seven counties of the greater Denver metropolitan area, which includes DEN. A portion of the study area is currently served by bus transit, and commuter rail transit between DEN and Union Station in downtown Denver is now in service. The study area is currently served by limited, express, and Skyride bus service as shown on Figure 3-2. The current types of bus service are presented in Table 3-1.

**Table 3-1**  
**Existing Bus Transit Service**

Bus Type	Route(s)
<b>Limited</b>	169L
<b>Express</b>	145X
<b>Skyride</b>	AA, AB, AT

*Source: RTD, 2016*

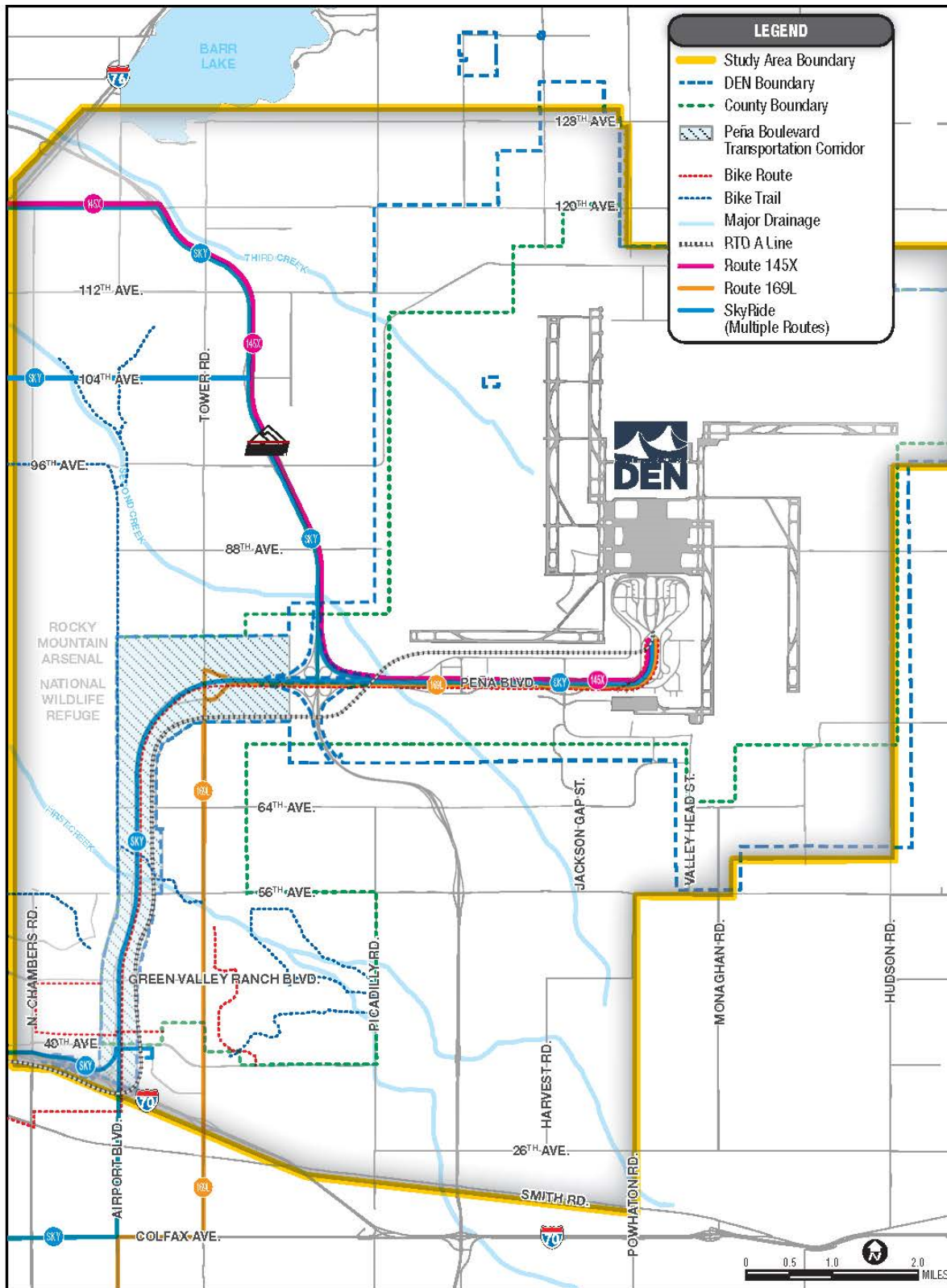
Limited route 169L provides daily service between DEN and southeast Aurora. Express route 145X serves the Brighton area. Three Skyrides serve DEN from multiple locations within the Denver metro region: route AA (Westminster/Thornton), route AB (Boulder) and AT (Aurora).

The University of Colorado A Line commuter rail service between DEN and Denver Union Station commenced in April 2016. A Line stations include Union Station, 38<sup>th</sup> and Blake, 40<sup>th</sup> and Colorado, Central Park, Peoria, 40<sup>th</sup> and Airport Boulevard, 61<sup>st</sup> and Peña, and DEN.

### 3.4 Trails and Bicycle Routes

The majority of existing trails and bicycle routes within the study area are City and County of Denver routes and facilities. The City of Aurora also provides a few trails. Currently there are no established trails/routes maintained by Adams County. The existing trail network is presented on Figure 3-2.

**Figure 3-2**  
**Transit Service, Trails, and Major Drainages**



Denver routes D-2, D-2A, and D-25 serve the southwest portion of the study area, primarily the Green Valley Ranch and Gateway areas of Denver. In addition, the existing DEN route provides bicycle access to the DEN terminal via the shared shoulders of Peña Boulevard. The Highline Canal Trail provides regional bicycle access through Aurora to Green Valley Ranch. The Highline Lateral Trail branches from the Highline Canal Trail to provide access to the Rocky Mountain Arsenal National Wildlife Refuge. The First Creek Trail is also provided along the portion of the First Creek drainage between Tower Road and the Rocky Mountain Arsenal National Wildlife Refuge.

The Rocky Mountain Arsenal National Wildlife Refuge is developing a trail that will encompass the entire perimeter of the refuge. The trails along the northern and eastern boundaries of the refuge are currently completed.

### 3.5 Major Drainages

There are three major drainage corridors within the study area: First, Second and Third Creeks. In general, these drainages convey runoff from the southeast to the northwest through the western half of the study area. The transportation infrastructure includes numerous bridges and culverts at the crossings of each of the three drainages. In addition, each drainage corridor provides the opportunity for multimodal connectivity via the construction of multi-use trails. Below is a summary of each drainageway and the intersecting major transportation facilities. Each drainageway is shown on Figure 3-2.

#### 3.5.1 First Creek

The First Creek drainage extends from approximately from the intersection of Smith Road/Powhatan Road northwest to the Peña Boulevard/56<sup>th</sup> Avenue interchange before entering the Rocky Mountain Arsenal National Wildlife Refuge. The drainage crosses E-470, Picadilly Road, Tower Road, 56<sup>th</sup> Avenue, and Peña Boulevard. The planned future extension of Green Valley Ranch Boulevard east of Picadilly Road will also cross First Creek.

#### 3.5.2 Second Creek

The Second Creek drainage extends from approximately 48<sup>th</sup> Avenue/Powhatan Road northwest to the intersection of 104<sup>th</sup> Avenue/Chambers Road. The drainage is crossed by 56<sup>th</sup> Avenue, Peña Boulevard, E-470, Tower Road, 88<sup>th</sup> Avenue, 104<sup>th</sup> Avenue, and Chambers Road.

#### 3.5.3 Third Creek

Third Creek is the primary drainage for the DEN airfield. It extends from the western portion of DEN property to the northwest to the E-470/120<sup>th</sup> Avenue interchange. The drainage is crossed by 104<sup>th</sup> Avenue, Tower Road, and 120<sup>th</sup> Avenue.

### 3.6 Regional Detention Ponds

Six regional detention ponds have been established in the Peña Boulevard Transportation Corridor in cooperation with the Urban Drainage & Flood Control District (UD&FCD) as documented in the associated MOU dated May 1, 2003. The six detention areas provide a total of 118 surface acres of area. The MOU documents the location of the six ponds. The Silverado II pond is located between 40<sup>th</sup> Avenue and Green Valley Ranch Boulevard. The Silverado I and Highline ponds are located on the east side of Peña Boulevard between Green Valley Ranch Boulevard and 56<sup>th</sup> Avenue. The Blue Grama and Dogwood ponds are on the east side of Peña Boulevard between 56<sup>th</sup> Avenue and 72<sup>nd</sup> Avenue. Pond S-243 is located northeast of the Tower Road/72<sup>nd</sup> Avenue intersection.



## 4. Corridor Traffic

### 4.1 Peña Boulevard Count Program

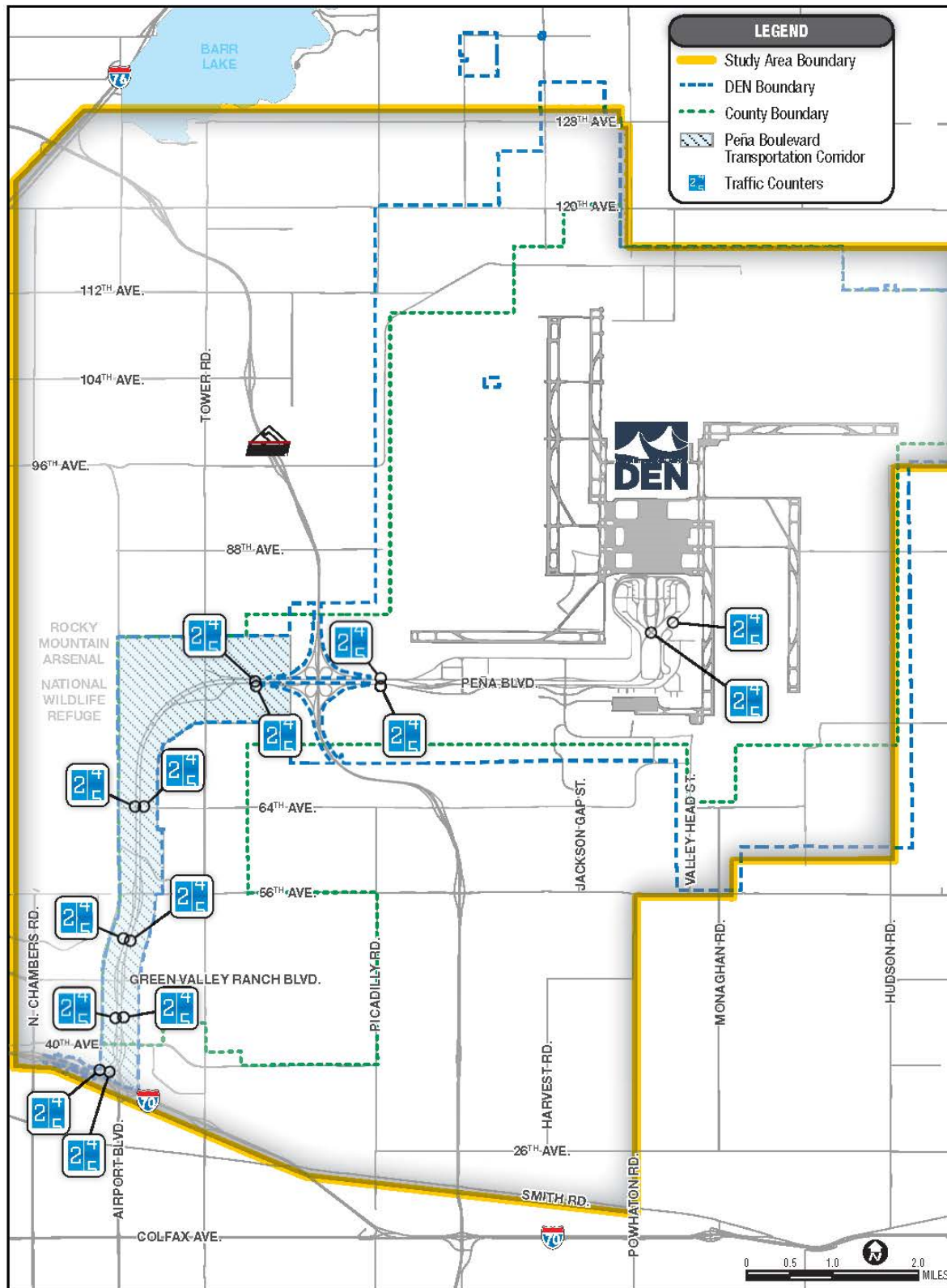
DEN conducts a regular traffic-counting program on Peña Boulevard to monitor and document traffic volume changes on the roadway. Counter locations are shown on Figure 4-1, and are located:

- Between I-70 and 40<sup>th</sup> Avenue
- Between 40<sup>th</sup> Avenue and Green Valley Ranch Boulevard
- Between Green Valley Ranch Boulevard and 56<sup>th</sup> Avenue
- Between 56<sup>th</sup> Avenue and Tower Road
- Between Tower Road and E-470
- East of the E-470 Ramps
- At the access roads to the East and West Terminals

The Peña Boulevard Corridor Data Collection and Travel Demand Analysis (Felsburg Holt & Ullevig, October 2012) documented that study's traffic data collection program that included quarterly counts of Peña Boulevard and a more comprehensive count program of 40+ locations in the Peña Boulevard corridor study area. The quarterly and 40+ location count program was continued during this current corridor study.



**Figure 4-1**  
**Traffic Count Program Locations**



Source: DEN, 2016

## 4.2 Historic Traffic Trends

The Peña Boulevard traffic count program has been conducted in various years since the completion of DEN. As a result, the historic changes in volume along the segments of Peña Boulevard can be assessed. Table 4-1 presents the bi-directional volumes on Peña Boulevard from counts taken in 1998, 2006, and 2015. The associated annual growth rate between counts is also presented.

**Table 4-1**  
**Historic Daily Traffic Volumes**

Peña Boulevard Segment	1998 ADT	2006 ADT (Summer Growth from 1998)	2015 ADT (Summer Growth from 2006) [Summer Growth from 1998]
<b>40<sup>th</sup> Avenue to Green Valley Ranch Boulevard</b>	67,500	85,100 (2.9%)	112,700 (3.2%) [3.1%]
<b>Green Valley Ranch Boulevard to 56<sup>th</sup> Avenue</b>	61,400	75,300 (2.6%)	94,600 (2.6%) [2.6%]
<b>56<sup>th</sup> Avenue to Tower Road</b>	59,000	73,700 (2.8%)	83,300 (1.4%) [2.0%]
<b>Tower Road to E-470</b>	68,600	74,000 (1.0%)	84,600 (1.5%) [1.2%]
<b>East of E-470</b>	75,000	90,900 (2.4%)	104,700 (1.6%) [2.0%]

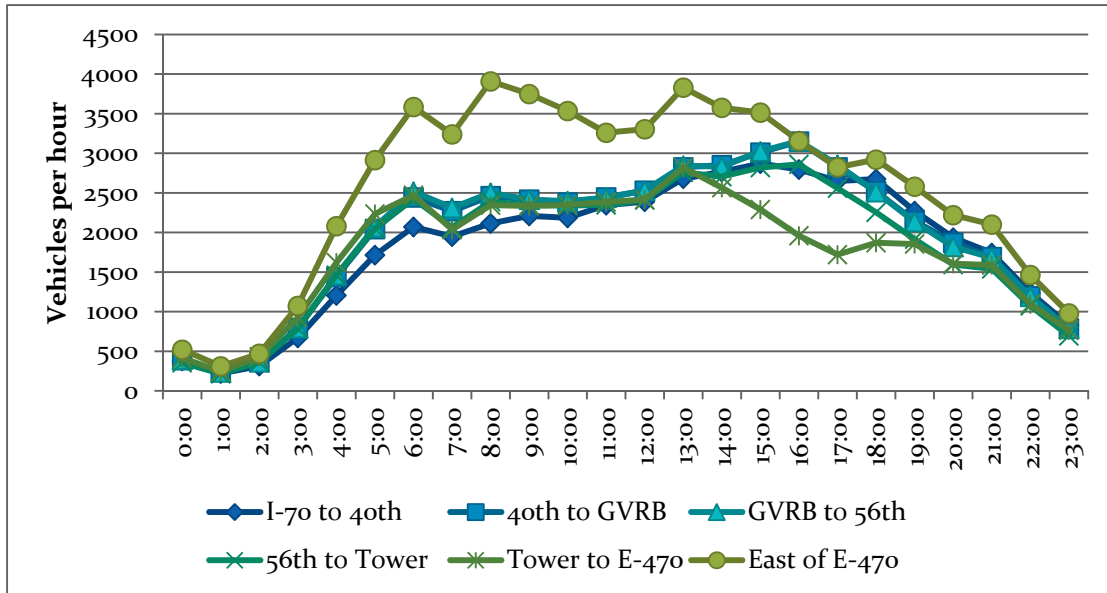
Source: URS 2016 and DEN. ADT = Average Daily Traffic

The daily volumes within each segment show growth from 1998 to 2015, which would be expected with the increase in DEN passenger traffic and off-airport development over that time. Historically, the highest volumes along Peña Boulevard are east of E-470 and between 40<sup>th</sup> Avenue and Green Valley Ranch Boulevard. The lowest volume has been recorded on the segment between 56<sup>th</sup> Avenue and Tower Road. This is likely a result of no on-ramp from Tower Road to southbound Peña Boulevard. Directional volumes within the 56<sup>th</sup> Avenue to Tower Road segment show a much higher northbound daily volume compared to the southbound daily volume.

In terms of volume growth over time, most segments of Peña Boulevard show similar rates of volume growth from 1998 to 2006. Most segments experienced a volume increase between 2.4 to 2.9 percent per year. The lone exception was the segment between Tower Road and E-470, which only increased by approximately 1.0 percent per year. Similarly, from 1998 to 2015, most segments experienced volume increases between 2.0 to 3.1 percent per year, with the exception of the segment between Tower Road and E-470, which only increased by approximately 1.2 percent per year. From 2006 to 2015, the rate of traffic growth increased for all segments of Peña Boulevard. Growth rates ranged from 1.4 to 3.2 percent annually. Both 2006 and 2015 counts were taken during the summer time.

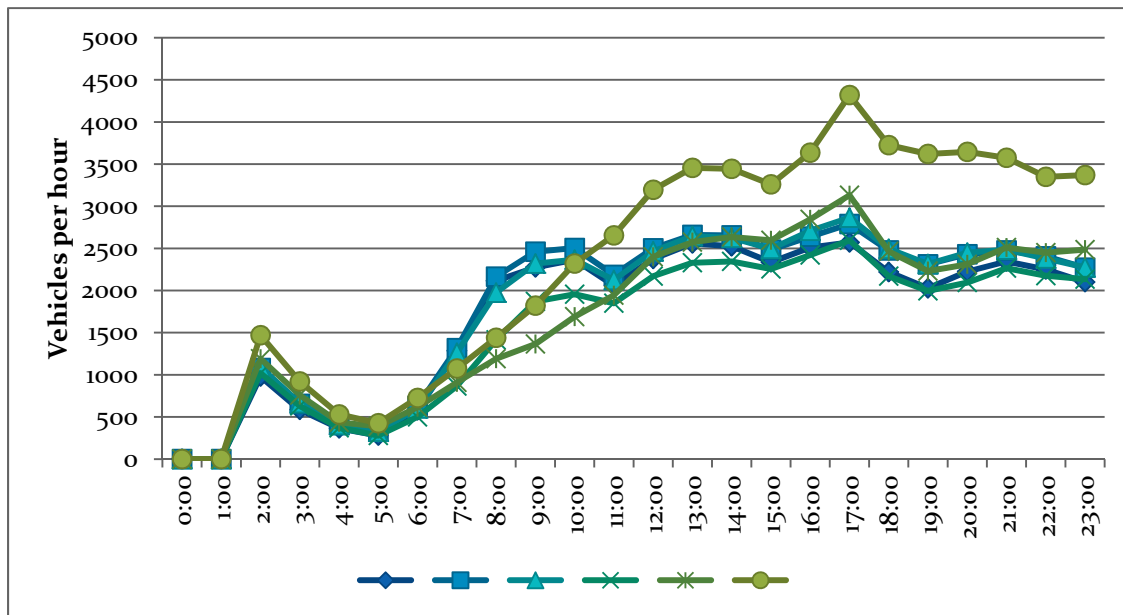
The variation of hourly volumes along Peña Boulevard is also important to the planning process. Airport traffic demand may differ from the typical daily commuting travel demand in the Denver metro region. Figures 4-2 and 4-3 depict the average hourly demand from December 2015 in the northbound/eastbound and southbound/westbound directions respectively. Each set of data points represents a different location along the Peña Boulevard corridor.

**Figure 4-2**  
**Northbound/Eastbound Peña Boulevard December 2015 Hourly Counts**



Source: URS 2016. GVRB = Green Valley Ranch Boulevard

**Figure 4-3**  
**Southbound/Westbound Peña Boulevard December 2015 Hourly Counts**



Source: URS 2016. GVRB = Green Valley Ranch Boulevard

The hourly counts along Peña Boulevard demonstrate the rather consistent volume of traffic in each direction between 6 a.m. and 6 p.m., which reflects the most intense hours of operation at DEN. Unlike typical weekday commuter traffic, Peña Boulevard does not have a meaningful decrease in traffic during

the mid-day hours between 9 a.m. and 4 p.m. Interestingly, Airport-related traffic east of E-470 shows almost a linear decrease from 1 p.m. to 12:00 a.m. (midnight) in the northbound direction and much more variations in the southbound direction. The other five count locations in the corridor mirror this linear nature both in the northbound and southbound directions. The hourly variations in the northbound and southbound direction are very consistent at all five count locations.

In the northbound/eastbound direction, the AM peak hour is typically 6 a.m. and 7 a.m. between Green Valley Ranch and west of E-470. The AM peak hour is 8:00 a.m. to 9:00 a.m. between 40<sup>th</sup> Avenue and Green Valley Ranch, and between east of E-470 and DEN airport. The AM peak hour is typically 11 a.m. to 12:00 p.m. (noon) between I-70 and 40<sup>th</sup> Avenue. The AM peak hour represents approximately 5.3 to 6.4 percent of the daily traffic in the northbound/eastbound direction. The PM peak hour is typically 1 p.m. to 2 p.m. between Tower Road and DEN airport. The PM peak hour is 3 p.m. to 4 p.m. between I-70 and 40<sup>th</sup> Avenue. The PM peak hour is 4 p.m. to 5 p.m. between 40<sup>th</sup> Avenue and Tower Road. The PM peak hour represents approximately 6.3 to 6.7 percent of the daily traffic in the northbound/eastbound direction.

In the southbound/westbound direction, the AM peak hour is 11 a.m. and 12:00 p.m. (noon) for all segments. The AM peak hour represents approximately 5.6 to 5.7 percent of daily traffic in this direction. The PM peak hour is typically between 2 p.m. and 3 p.m. along this direction of Peña Boulevard for all segments. The PM peak hour represents approximately 5.8 to 7.0 percent of the daily traffic in the southbound/westbound direction.

### 4.3 Existing Levels of Service (LOS)

The traffic counts taken in December 2015 were used to estimate a level of service for each segment of Peña Boulevard in both directions during the AM and PM peak hours. In general, the AM peak hour volume was defined as the highest hour of counts prior to 12:00 p.m. (noon). The PM peak hour was considered the highest hour of counts after 12:00 p.m. The Highway Capacity Software (HCS) 2010 software based on the *Highway Capacity Manual (HCM) 2010* within *Mc Trans, TRB* was used to estimate the existing levels of service which are presented in Table 4-2. As shown, all segments of Peña Boulevard operated at LOS D or better during both peak hours.

**Table 4-2**  
**Existing (December 2015) Levels of Service (LOS)**

Peña Boulevard Segment	Direction	Number of Lanes	AM Peak Hour		PM Peak Hour	
			Volume (vph)	LOS	Volume (vph)	LOS
<b>I-70 to 40<sup>th</sup> Avenue</b>	NB	2	2,345	C	2,870	C
	SB	2	2,560	C	2,570	C
<b>40<sup>th</sup> Avenue to Green Valley Ranch Boulevard</b>	NB	2	2,460	C	3,150	D
	SB	2	2,660	C	2,790	C
<b>Green Valley Ranch Boulevard to 56<sup>th</sup> Avenue</b>	NB	2	2,515	C	3,155	D
	SB	2	2,645	C	2,865	C
<b>56<sup>th</sup> Avenue to Tower Road</b>	NB	2	2,425	C	2,860	C
	SB	2	2,330	C	2,595	C
<b>Tower Road to E-470</b>	EB	2	2,470	C	2,820	C
	WB	3	2,575	B	3,130	B
<b>East of E-470</b>	EB	3	3,910	C	3,830	C
	WB	3	3,455	C	4,320	C

Source: URS and DEN, 2017

## 4.4 Traffic Patterns

The traffic count program on Peña Boulevard as well as supplemental traffic counts on surrounding arterial roadways have been used to document traffic patterns within the study area. The previous analysis of study area traffic patterns is documented in the Peña Boulevard Corridor Data Collection and Travel Demand Analysis report from October 2012. Figure 4-4 shows the daily volumes from the 2012 study and quarterly traffic counts collected in this current study. For this analysis, the data collection program included counts at 40+ locations on the mainline and ramps along Peña Boulevard and surrounding arterial roadways in May 2014 and May 2015 during weekday periods. Quarterly counts were taken on the mainline segments of Peña Boulevard.

As shown on Figure 4-4, the most recent (May 2016) daily volumes along Peña Boulevard ranged from 86,300 vehicles per day (vpd) between 56<sup>th</sup> Avenue and Tower Road to 115,400 vpd east of E-470. In comparison, the earliest counts shown on the graphic (May 2011) show traffic demand of 64,400 vpd between 56th Avenue and Tower Road and 88,600 vpd east of E-470.

The quarterly count data demonstrates some of the seasonal demand on Peña Boulevard. February is a non-peak travel time month with the lowest daily volumes and May and August are peak travel time months with the highest daily volumes.

The highest volume ramps in the Peña Boulevard corridor are at 40th Avenue, reflecting the connection from Airport Boulevard to the south. All of the surrounding arterial roadways saw increases in traffic demand since 2011, most notably Tower Road north of Peña Boulevard and Green Valley Ranch Boulevard east of Peña Boulevard.

In the 2012 study, an origin-destination survey, using the Denver Regional Council of Governments (DRCOG) regional transportation model and Bluetooth readers, was used to assess the trip patterns on Peña Boulevard, in an attempt to quantify the proportion of Airport and non-airport related traffic on the roadway. The study evaluated traffic on five separate segments of Peña Boulevard, identifying whether a vehicle was coming from or going to DEN, or was a non-airport trip. Non-airport trips were aggregated as those having an origin or destination in a Denver metro area county (Denver County, Adams County, and Arapahoe County) and all remaining counties.

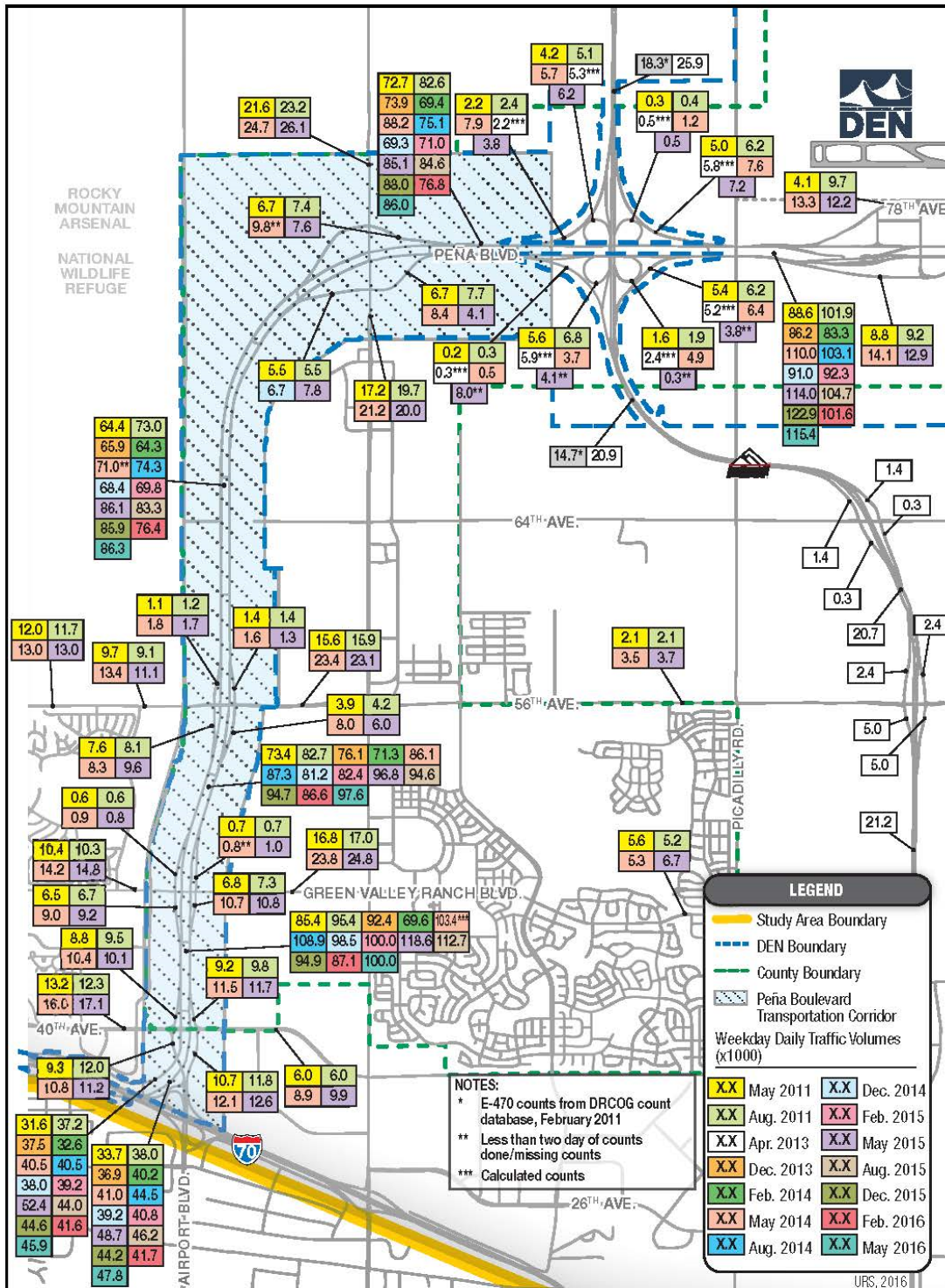
The segments of Peña Boulevard that were studied were: I-70 to Green Valley Ranch Boulevard, Green Valley Ranch Boulevard to 56th Avenue, 56th Avenue to Tower Road, Tower Road to E-470, and E-470 to DEN. A breakdown of trip origins and destinations for each segment was then developed.

Table 4-3 shows the comparison of Peña Boulevard inbound traffic with an airport destination for the years 2005, 2011 and 2014. As shown, in 2005, approximately 59 percent of the daily traffic on Peña Boulevard south of Green Valley Ranch Boulevard has an origin or destination of DEN. Closer to the airport a greater percentage of traffic is related to DEN, with as much as 77 percent.

In 2011, as the segments approach I-70, the proportion of non-airport traffic increases, with approximately 37 percent of Peña Boulevard traffic being non-airport related at the I-70 interchange. Between Green Valley Ranch Boulevard and 56th Avenue, approximately 28 percent of traffic is non-airport related. North of 56th Avenue, the proportion of non-airport traffic decreases to seven percent. The 2011 origin-destination data showed that the majority of non-airport trips are from or destined to either Denver County or Adams County. In general, these trips are made by drivers accessing the area surrounding Peña Boulevard, especially the area bounded by Peña Boulevard, E-470, and I-70. The Green Valley Ranch development is the primary development within this area. Most non-airport trips access Peña Boulevard at the 40th Avenue, Green Valley Ranch Boulevard, and 56th Avenue interchanges. Figure 4-5 shows the same percentages as Table 4-3 for 2011 Peña Boulevard trip analysis.



**Figure 4-4**  
**Existing Study Area Daily Traffic Volumes**



- 2011 Counts Source: Peña Boulevard Corridor Data Collection and Travel Demand Analysis Revised Final Study by Felsburg, Holt & Ulveg (October, 2012)  
All Traffic Data Inc. Counts: May 10th and 11th, 2011 (Tuesday, Wednesday), and August 2nd and 3rd, 2011 (Tuesday, Wednesday)
- 2013 Counts Source: E-470 2014 Investment Grade Traffic and Revenue Study Final Report (October, 2014)
- Traffic Research & Analysis, Inc. Counts: December 10th, 11th and 12th, 2013 (Tuesday, Wednesday and Thursday), February 11th, 12th and 13th, 2014 (Tuesday, Wednesday and Thursday), May 19th - 23rd, 2014 (Monday - Friday), August 26th and 27th, 2014 (Tuesday, Wednesday), December 9th and 10th, 2014 (Tuesday, Wednesday), February 10th and 11th, 2015 (Tuesday, Wednesday), May 12th, 13th, and 14th 2015 (Tuesday, Wednesday, and Thursday), August 25th and 26th, 2015 (Tuesday, Wednesday)
- DEN Permanent Traffic Sensor Counts: December 16th and 17th, 2015 (Wednesday, Thursday), February 3rd and 4th, 2016 (Wednesday, Thursday), May 11th and 12th, 2016 (Wednesday, Thursday)



In 2014, URS analyzed the origin-destination of Peña Boulevard traffic using Bluetooth readers. Data was collected from May 18 to May 24.

As shown, the 2014 data collection program showed increases in non-airport demand on Peña Boulevard. At the south end of the corridor, the proportion of non-airport traffic was approximately 37 percent in 2011 increasing slightly to 39 percent in 2014. Between Green Valley Ranch (GVR) Boulevard and 56<sup>th</sup> Avenue, non-airport traffic is approximately 28 percent in 2011 and 29 percent in 2014. Between 56<sup>th</sup> Avenue and Tower Road, non-airport traffic was approximately seven percent in 2011 and 16 percent in 2015. The northern segment, between Tower Road and E-470, saw the greatest change in non-airport traffic demand, with approximately four percent non-airport demand in 2011 and ten percent in 2014. Some differences could be explained by increased development in the airport area in recent years, and the dissimilar data collection and analysis methods used for each study. Figure 4-6 shows the same percentages as Table 4-3 for 2014 Peña Boulevard trip analysis.

Over 10 years, the average percentage of airport traffic versus non-airport traffic had no significant changes with 70 percent airport traffic and 30 percent non-airport traffic in 2005, and 77 percent airport traffic and 23 percent non-airport traffic in 2014.

**Table 4-3**  
**Airport Destination Percentage Comparison 2011 vs 2014**

Inbound Peña Boulevard Segment	Vehicles with a DEN/non-DEN destination (2005)	Vehicles with a DEN/non-DEN destination (2011)	Vehicles with a DEN/non-DEN destination (2014)
<b>40<sup>th</sup> Avenue to Green Valley Ranch Boulevard</b>	59% / 41%	63% / 37%	61% / 39%
<b>Green Valley Ranch Boulevard to 56<sup>th</sup> Avenue</b>	67% / 33%	72% / 28%	71% / 29%
<b>56<sup>th</sup> Avenue to Tower Road</b>	77% / 23%	93% / 7%	84% / 16%
<b>Tower Road to E-470</b>	77% / 23%	96% / 4%	90% / 10%
<b>Average</b>	<b>70% / 30%</b>	<b>81% / 19%</b>	<b>77% / 23%</b>

*Source: 2005 values obtained from Denver Strategic Transportation Plan Gateway Travel Shed Evaluation, FHU April 2007*

*2011 values obtained from Peña Boulevard Corridor Data Collection and Travel Demand Analysis, FHU October 2012*

*2014 values obtained from Bluetooth data collected May 18, 2014 to May 24, 2014 and analyzed by URS, July 2014*

Tables 4-4 through 4-5 provide an expanded summary of the origin-destination analysis using segment length to “weight” the airport/non-airport demand in the Peña corridor. Forecast changes in travel demand and O&D patterns, using the DRCOG Focus model (see Section 4.5), are shown on Table 4-5. Note that all traffic (100%) on Peña Boulevard east of E-470 is assumed to have a DEN origin-destination.

As shown on Table 4-4, using the segment distance weighting approach, the current overall split of demand in the Peña Boulevard corridor from I-70 to E-470 is 76 percent of traffic with an airport origin-destination and 24 percent with a non-airport origin-destination. Using the current DRCOG Focus travel demand model, by 2040, this split of demand is forecast to shift to a larger share of non-airport demand on Peña Boulevard, with 56 percent of traffic forecasted to have an airport origin-destination and 44% with a non-airport origin-destination, as shown on Table 4-5. Using the DRCOG regional travel demand

model (formerly the Compass travel model), two previous studies have forecast a similar split between the airport and non-airport traffic for future years 2030 and 2035 which is consistent with values shown in Table 4-5 for 2040. However, the socioeconomic data projections used in the DRCOG regional travel demand model assumed that population and employment growth in the neighborhoods surrounding DEN would outpace the growth in passenger enplanements at the Airport. This shift in growth rates has not occurred within the past ten-year period (see Table 4.3). Rather, large increases in Airport Origin and Destination (O and D) passenger growth have outpaced surrounding population and employment growth. The actual future split between DEN and non-DEN traffic depends on the relative growth rates between the airport itself and the future land uses in the vicinity of Pena Boulevard.

**Table 4-4**  
**Vehicle Miles Traveled (VMT): Using May 2014 Origin and Destination Data**  
**and December 2015 Volume Data**

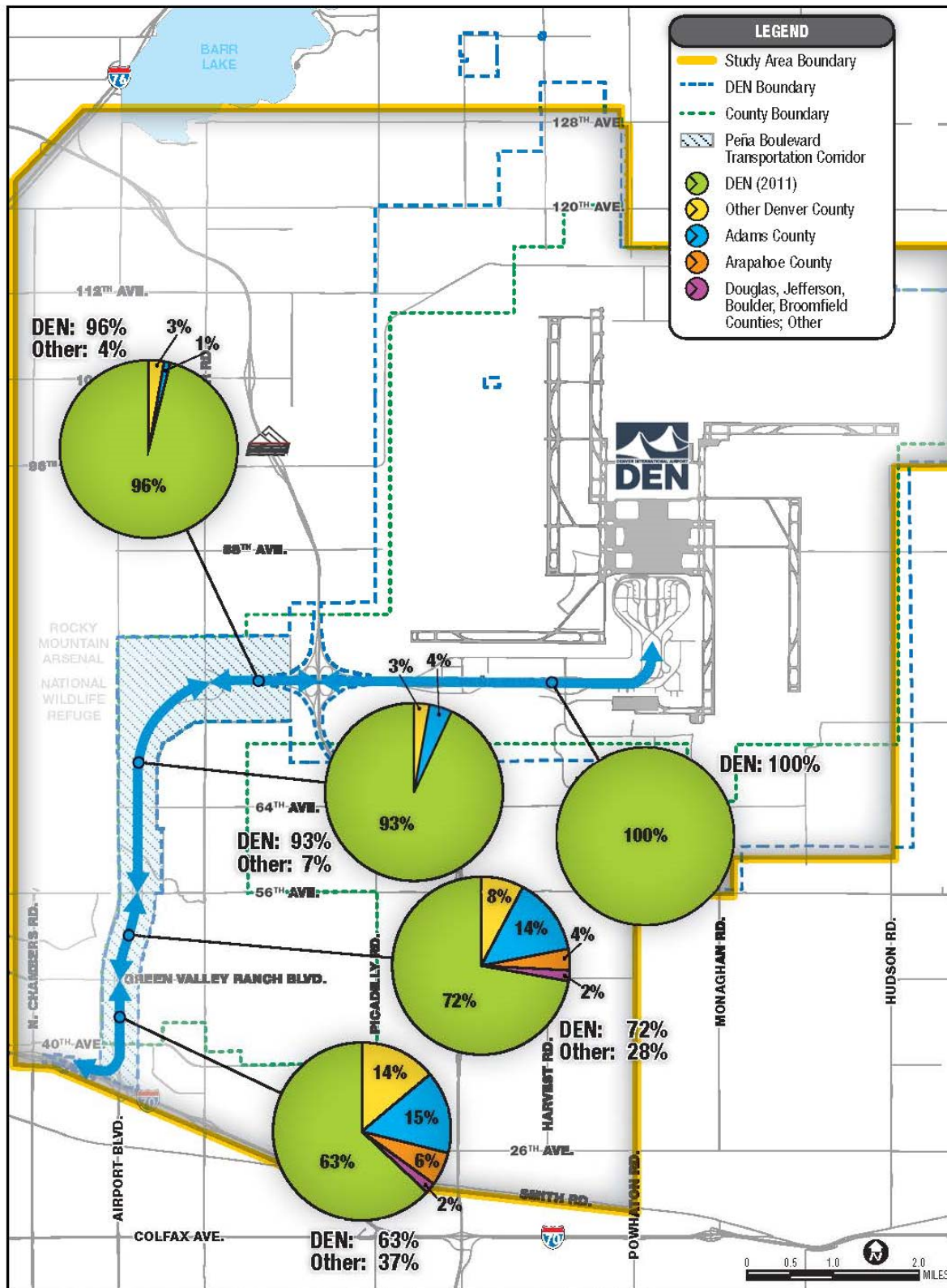
Segment	Segment Length (mi)	ADT Dec 2015	Daily VMT	DIA %	DIA VMT	Non-DIA %	Non-DIA VMT
<b>I-70-GVR</b>	2.1	98,151	206,117	61%	125,731	39%	80,386
<b>GVR-56th</b>	1.0	95,784	95,784	71%	68,007	29%	27,777
<b>56th- Tower</b>	2.8	94,482	264,550	84%	222,222	16%	42,328
<b>Tower-E470</b>	1.3	90,832	118,082	90%	106,273	10%	11,808
<b>Total VMT</b>			684,532		522,233		162,299
					76%		24%

**Table 4-5**  
**Vehicle Miles Traveled (VMT): Using DRCOG 2040 Forecast Volume and Forecast Origin**  
**and Destination Data**

Segment	Segment Length (mi)	ADT 2040	Daily VMT	DIA %	DIA VMT	Non-DIA %	Non-DIA VMT
<b>I-70-GVR</b>	2.1	166,900	350,490	41%	143,701	59%	206,789
<b>GVR-56th</b>	1.0	152,400	152,400	47%	71,628	53%	80,772
<b>56th- Tower</b>	2.8	134,400	376,320	60%	225,792	40%	150,528
<b>Tower-E470</b>	1.3	112,900	146,770	90%	132,093	10%	14,677
<b>Total VMT</b>			1,025,980		573,214		452,766
					56%		44%

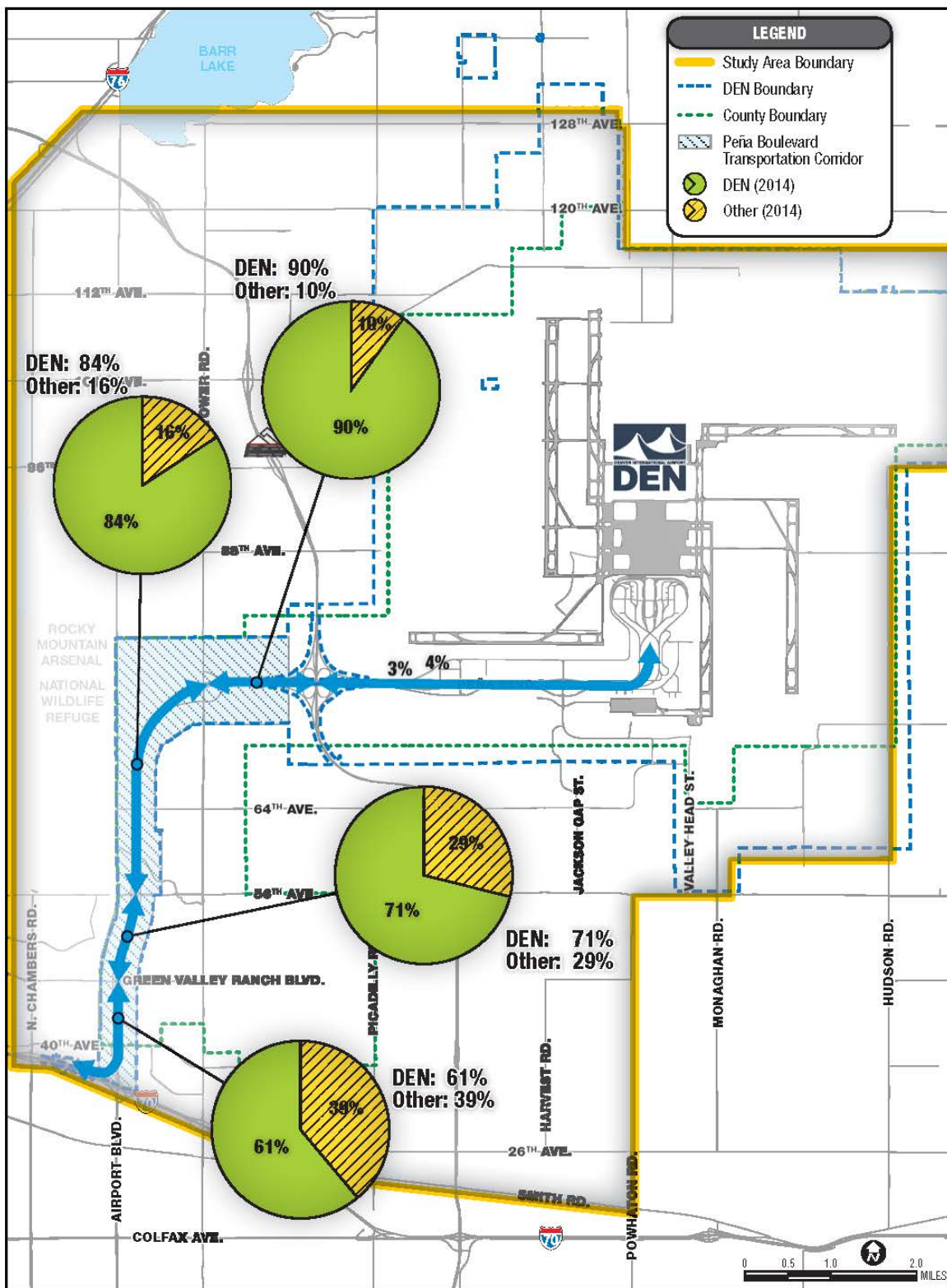
Note: 2040 Forecast volumes were assumed additional DEN access via 78th Avenue, Jackson Gap Street extension, and RTD A Line Commuter Rail

**Figure 4-5**  
**2011 Peña Boulevard Trip Analysis**



Source: 2011 values obtained from Peña Boulevard Corridor Data Collection and Travel Demand Analysis, 2012; DEN

**Figure 4-6**  
**2014 Peña Boulevard Trip Analysis**



Source: 2014 values obtained from bluetooth data collected May 18, 2014 to May 20, 2014 and analyzed by URS, July 2014



## 4.5 Traffic Forecasts

### 4.5.1 DRCOG Focus Model

#### 4.5.1.1 Overview of Model

The Denver Regional Council of Governments (DRCOG) Focus travel demand model was used to understand future travel patterns in the study area and to evaluate a range of transportation options. The Focus model synthesizes individual regional households and persons and forecasts their travel within the region throughout a typical weekday based on personal and travel-related characteristics. Activity-based models (ABM), like Focus, represent the next generation of travel demand models that more realistically simulate how people travel. While trip-based models consider every trip (whenever someone leaves for a new location) independently, activity-based models consider an entire set of trips from home, to various places, and back home. This is defined as a complete tour. Each tour includes a primary activity (e.g., work or shop) and may also include one or more secondary activities (e.g., pick up a passenger on the way home from work). This allows the relationships between trips that are part of the same tour to be considered.

#### 4.5.1.2 Calibration of Base Year Model in Study Area

The base year (2010) Focus model (Fall 2014 - Cycle 2 RTP) was calibrated before being used in this study. The calibration process involved adjusting the model to better replicate observed travel patterns and traffic counts in the study area. First, model results were compared against the most current household survey data – the Front Range Travel Counts (FRTC). The 2010 FRTC was a household survey that was conducted in four regions along the Front Range. They include:

- DRCOG;
- North Front Range Metropolitan Planning Organization (NFRMPO);
- Pikes Peak Area Council of Governments (PPACG); and
- Pueblo Area Council of Governments (PACOG).

A detailed comparison showed that there were too few survey samples to calibrate the model tours at a district-to-district interchange level. The next step in the model review process was to compare 2010 model volumes from Focus to available traffic counts. The traffic count dataset used for comparison included traffic counts posted on the DRCOG model networks, traffic counts obtained from a previous Peña Boulevard Study<sup>1</sup>, and time-of-day traffic counts that were collected in 2013. Initial review efforts included visual comparison of model volumes to traffic counts on a link by link basis, along with comparison of model volumes to traffic counts on several screenlines defined in the vicinity of Peña Boulevard.

The daily assignment results showed modeled traffic volumes higher than counts on Peña Boulevard just west of the E-470 interchange, but slightly lower than traffic counts just east of the E-470 interchange. On E-470, model volumes were significantly lower than traffic counts both north and south of Peña Boulevard. In reviewing a small number of detailed traffic counts within the airport property, traffic volumes inside of the airport have a relatively high degree of variation from traffic counts. Because Focus is a regional model and because internal airport circulation was not a major component of this study,

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<sup>1</sup> Felsburg Holt & Ullevig, *Peña Boulevard Corridor Data Collection and Travel Demand Analysis – Revised Final Report*, October 9, 2012.

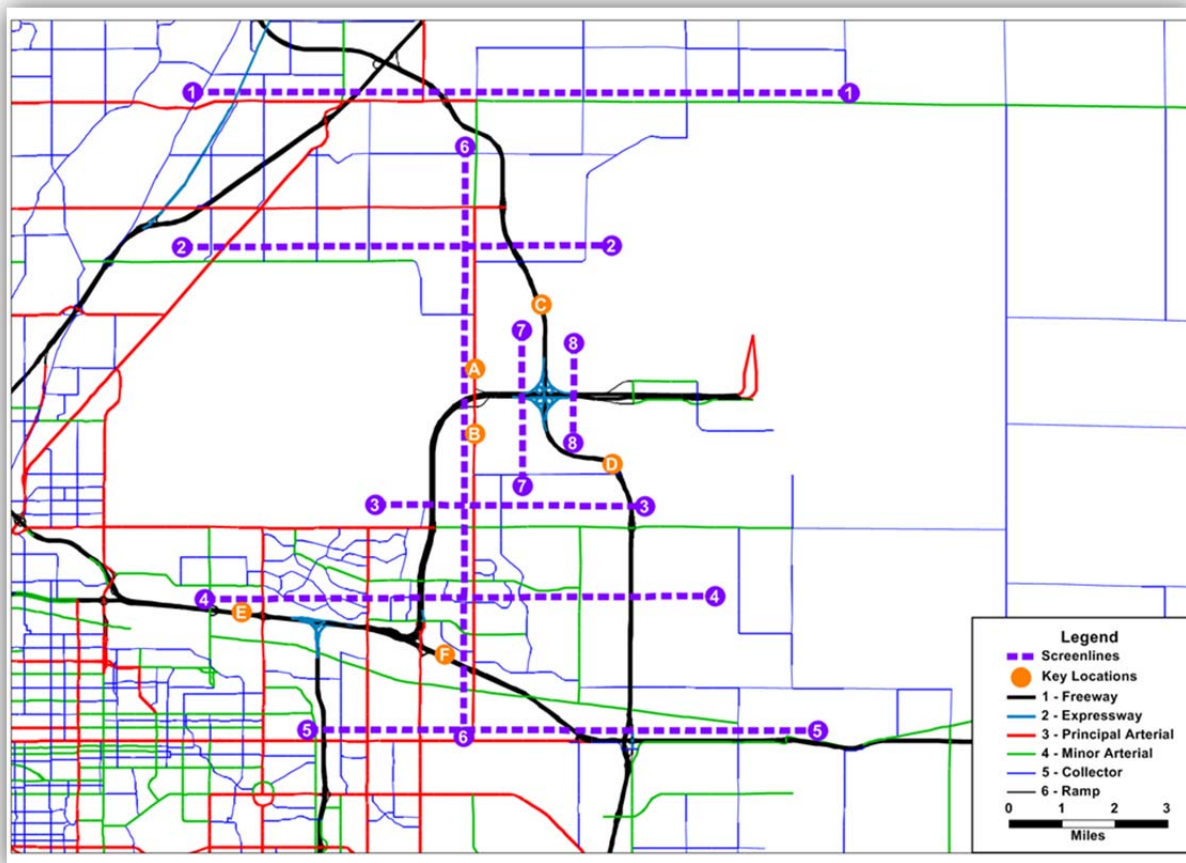


detailed traffic counts within the airport property were not further reviewed. The more important objective was to ensure total modeled traffic demand arriving and leaving DEN matched observed counts reasonably well. According to 2010 traffic counts, the average weekday, two-way traffic volume on Peña Boulevard east of E-470 was 95,200. The assigned traffic from the 2010 Focus model at that location was 88,300, or 7 percent below traffic counts.

Eight screenlines, shown in Figure 4-7, were created to assess the model's ability to represent major movements to, from, and within the study area. Each screenline captures all volumes crossing the line. For example, screenlines 7 and 8 capture east and west movements along Peña Boulevard. In addition, key locations were analyzed more closely due to their importance in circulating traffic to/from DIA. As shown in Figure 4-7, these locations include I-70, E-470, and Tower Road.

Overall, the screenline volumes showed the initial Focus model volumes were lower than observed volumes in most cases. There were two exceptions where modeled traffic volumes were higher than counts: on Tower Road, the model volumes were too high north of Peña Boulevard and too low south of Peña Boulevard. On I-70, modeled traffic volumes west of Peoria were low by 15 percent and high by 25 percent west of Peoria. A key issue with the Focus model traffic assignment was the under-assignment of traffic on E-470. Compared to observed traffic counts, the modeled traffic volumes were 55 percent lower north of Peña Boulevard and 79 percent lower south of Peña Boulevard.

**Figure 4-7**  
**Screenlines and Key Locations**



Source: Cambridge Systematics, Inc.

Reasonable modeling of traffic volumes on E-470 was very important for this study since some of the initial future year options considered alternatives that included E-470. Moreover, since tolling options on Peña Boulevard were also initially considered, it was important that the Focus model was able to replicate observed traffic volumes reasonably well on toll facilities. DRCOG has recognized this issue with Focus and is studying options for improving modeling of tolled facilities.

Based on the initial results, there was still room to further improve the results in the project study area. Therefore, a procedure was used to adjust the trip tables incrementally from the regional model to better match observed traffic counts. This procedure is known as Origin Destination Matrix Estimation (ODME) and is a mathematical process that is performed within the existing travel demand model. Final model results were compared against summaries from the FRTC survey using an aggregated district geography; average trip lengths, and trip length frequency distribution. Based on these comparisons, the model was adequately calibrated for the project study area.

#### 4.5.1.3 Horizon Year (2040) Evaluation

The ODME process is useful for adjusting the base year trip tables but cannot be directly applied in the forecast year. Year 2040 vehicle trip tables were developed by adding the raw growth in travel demand to the adjusted base year vehicle trip tables. Results of the ODME process served as the adjusted base year vehicle trip tables. The adjusted forecast year vehicle trip tables were computed by applying the equation shown below to each zone pair in.

$$2040 \text{ Adj. Vehicle Trips} = 2010 \text{ Adj. Vehicle Trips} + (2040 \text{ Raw Vehicle Trips} - 2010 \text{ Raw Vehicle Trips})$$

It is important to use a generally accepted procedure to produce forecasts for roadway facilities with model results that are lower or higher than observed volumes in the base year. Raw 2040 model results were not used directly. A National Cooperative Highway Research Program (NCHRP) Report 765 procedure was applied to all 2040 traffic forecasts. Growth in volume between the base year and future year forecasts was applied to observed traffic volumes for the horizon year analysis.

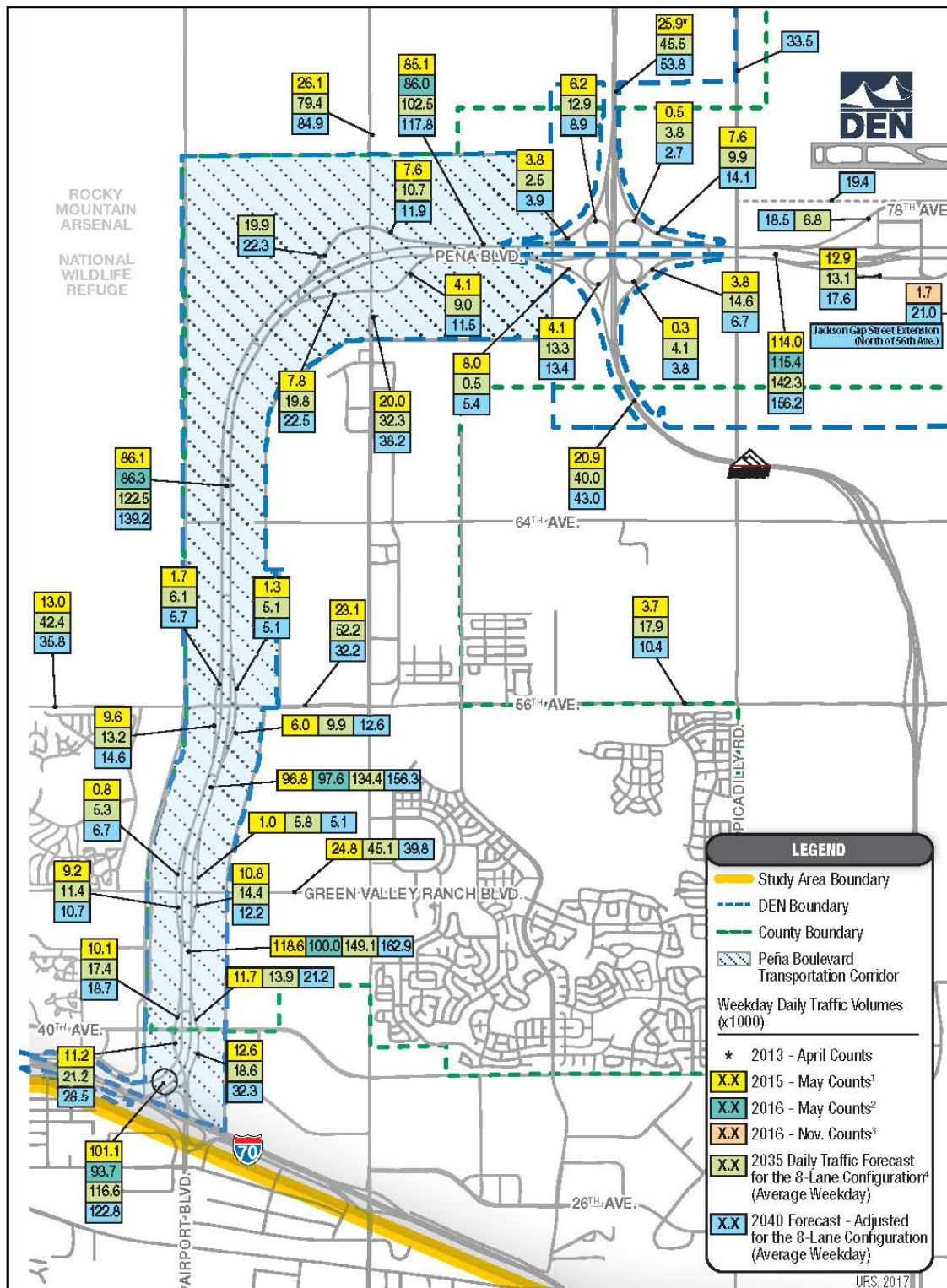
#### 4.5.1.4 2040 Forecasts

Figure 4-8 provides a summary of the 2040 traffic forecasts in the project study area assuming an eight-lane Peña Boulevard configuration. Year 2035 forecasts from the 2012 FHU Study and May 2015 traffic counts are also included for reference. At certain locations, there are instances where the 2035 forecasts are higher than 2040 forecasts. While this may not sound intuitive, it is important to note that the 2035 forecasts were developed using a different model system--DRCOG's trip-based Compass model. As mentioned above, the 2040 forecasts were developed using the Focus model which is a more advanced, activity based model. Moreover, varying network assumptions, different socioeconomic data (2035 versus 2040), and differences in other model inputs are also likely to affect the forecasts.

The 2040 traffic forecasts along Peña Boulevard were compared to current traffic counts from May 2015, revealing an increase in traffic volumes, ranging from 39 percent to 61 percent, depending on the location. For example, the Peña Boulevard segment between 40<sup>th</sup> Avenue and Green Valley Ranch Boulevard currently carries 118,600 vehicles during an average weekday. This is projected to increase by 44,000 vehicles to 163,000 by 2040, which would be a 39 percent increase. Similarly, the Peña Boulevard segment between 56<sup>th</sup> Avenue and Tower Road is forecasted to carry 139,000 vehicles in 2040. This growth would represent a 61 percent increase from the May 2015 traffic count of 86,100 vehicles. This traffic growth can be attributed to a variety of factors including growth in DEN enplanements, growth in regional population, employment and the addition of Tower Road ramp to westbound Peña Boulevard.



**Figure 4-8**  
**2040 Traffic Forecasts Peña Boulevard Study Area**



<sup>1</sup> Traffic Research and Analysis, Inc. Counts: May 12th, May 13th and May 14th, 2015

<sup>2</sup> DEN Permanent Traffic Sensor Counts: May 11th and May 12th, 2016

<sup>3</sup> All Traffic Data Counts (November, 2016)

<sup>4</sup> Peña Boulevard Corridor Data Collection and Travel Demand Analysis Revised Final Study by Felsburg, Holt & Ullavig (October, 2012)

Tower Road is also forecast to see a large increase in traffic by 2040. Currently, the Tower Road segment immediately north of Peña Boulevard carries 26,100 vehicles during an average weekday. The 2040 forecasts suggest traffic demand will increase by almost 59,000 vehicles to 85,000 vpd. South of Peña Boulevard, traffic on Tower Road is forecasted to increase from 20,000 vehicles today to 38,200 vehicles in 2040.

#### 4.5.1.5 Land Use and Employment Assumptions at DEN

DRCOG is responsible for maintenance of the Focus model and also development of one of its main inputs, socioeconomic data. DRCOG's economist and land use planning staff develop regional forecasts of population and employment based on national and local trends, economic models, and coordination with local governments. Regional forecasts of population and employment are allocated to the transportation analysis zones (TAZ) using UrbanSim. UrbanSim is a detailed parcel-based model that simulates how developers, businesses, and households interact in the land use market.

For the horizon year, the 2040 RTP socioeconomic dataset was used as input to the Focus model. Table 4-6 shows a comparison of employment forecasts between 2010 and 2040. Figure 4-9 shows the fifteen DEN transportation analysis zones that comprise it. Overall, total employment at DEN is forecasted to increase by 141 percent from 2010 to 2040. Population estimates were not included for DEN TAZs because this sum is insignificant. By 2040, this assumption is not expected to change.

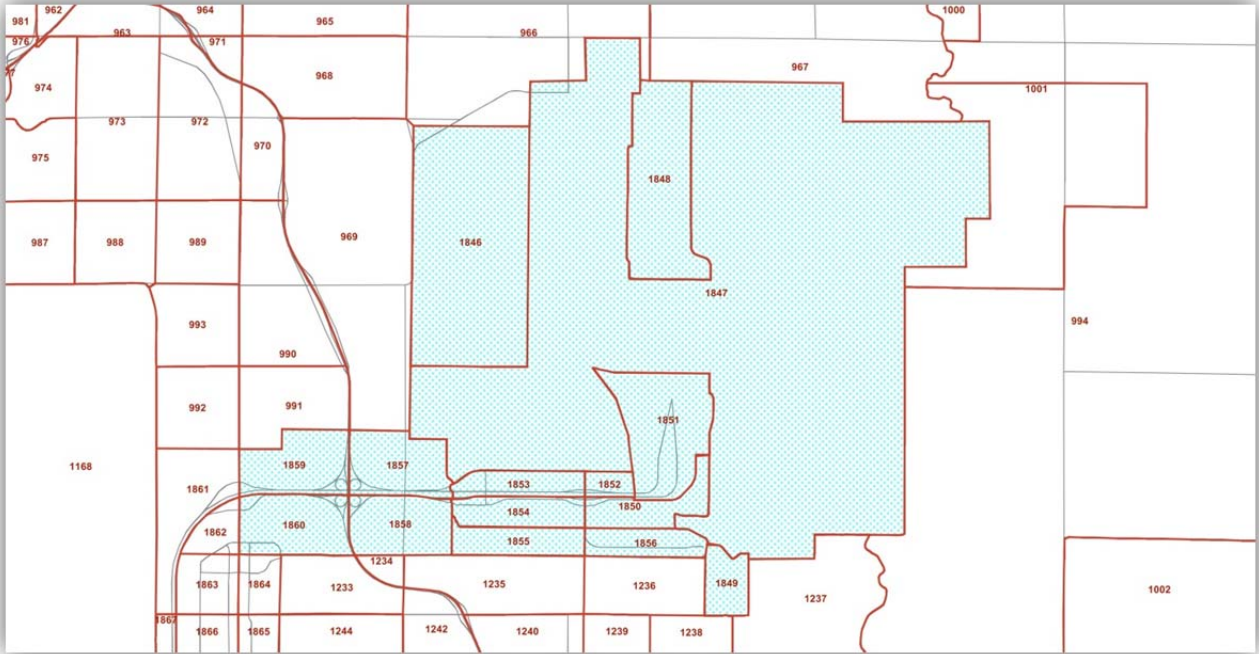
**Table 4-6**  
**Comparison of Land Use Assumptions at DEN**

Transportation Analysis Zone	2010 Employment	2040 Employment <sup>1</sup>
<b>1846</b>	0	949
<b>1847</b>	1832	1,991
<b>1848</b>	363	4,476
<b>1849</b>	0	0
<b>1850</b>	1,704	1,004
<b>1851</b>	12,009	28,487
<b>1852</b>	333	364
<b>1853</b>	1,267	2,183
<b>1854</b>	13	13
<b>1855</b>	0	0
<b>1856</b>	0	0
<b>1857</b>	0	890
<b>1858</b>	0	1,014
<b>1859</b>	0	0
<b>1860</b>	136	1,262
<b>Total</b>	<b>17,657</b>	<b>42,634</b>

<sup>1</sup>The 2040 employment totals reflect revised employment estimates submitted by DEN Real Estate to the Denver Regional Council of Governments



### Figure 4-9



Source: DRCOG Focus Model TAZ Layer

#### 4.5.1.6 Transportation Network Assumptions

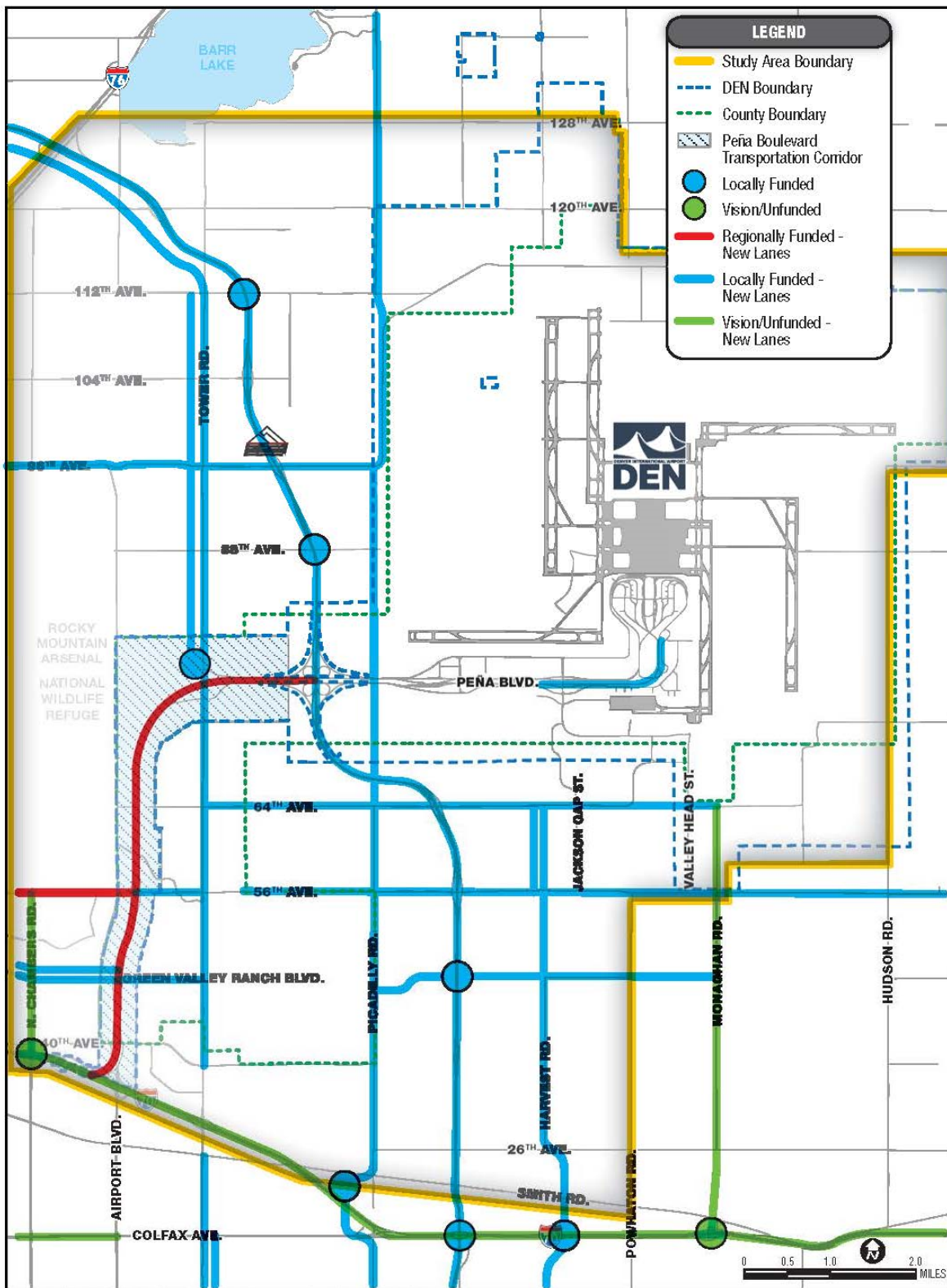
The transportation network from DRCOG’s 2040 Fiscally Constrained Regional Transportation Plan (RTP) (adopted on February 18, 2015) was used to develop the future year traffic forecasts for the Peña Boulevard Corridor Transportation Study. Figure 4-10 shows DRCOG 2040 Fiscally Constrained RTP. The following major RTP roadway projects were included in the model network:

- Peña Boulevard – widen from four lanes to eight lanes from I-70 to E-470;
- Picadilly Road – widen to six lanes from Smith Road to 70<sup>th</sup> Avenue;
- Picadilly Road – new six lane facility from 70<sup>th</sup> Avenue to 96<sup>th</sup> Avenue;
- Picadilly Road – new six lanes facility from 96<sup>th</sup> Avenue to 120<sup>th</sup> Avenue;
- Tower Road – widen to six lanes from 56<sup>th</sup> Avenue to 104<sup>th</sup> Avenue;
- Tower Road – on ramp to westbound Peña Boulevard;
- Harvest Road – new/upgraded six lanes facility from 56<sup>th</sup> Avenue to I-70.

Other RTP projects that would impact Peña Boulevard demand is RTD's Commuter Rail "A" Line. Appendix B shows 2040 RTP Projects in Peña Boulevard Corridor Transportation Study Area.



**Figure 4-10**  
**DRCOG 2040 Regional Transportation Plan**



Source: DRCOG 2040 Metro Vision Regional Transportation Plan, URS 2017

#### 4.5.1.7 2015 Ricondo & Associates, Inc. Enplanement Assumptions

All traffic forecasts were developed using the latest enplanement assumptions documented in Ricondo & Associates, Inc.'s October 13, 2015 Master Plan Refinement (MPR) as shown in Figure 4-11. For 2040, Ricondo forecasted 58.4 million annual origins and destinations (O&D). About 37 million are connecting passengers for 95.3 million total passengers. Enplanements are calculated by taking the grand total (95.3 million) and dividing by two since enplanements represent revenue passenger boardings.

Another important assumption in the Ricondo forecasts is the percentage origination. Based on the above estimates, Ricondo is assuming a 61.3 percent origination in 2040. This assumption is important because it affects the potential demand on Peña Boulevard as air passengers with one leg of their trip in the Denver metro area will use ground transportation such as public transit, private automobiles, rental cars, taxi, or vanpools. Connecting passengers, on the other hand, rarely leave the airport.

In the Focus model, these originating passengers are accounted for using a special generator model for the airport. Passenger trip demand is calculated with the following formula:

$$\text{Passenger Trips} = \frac{(\text{Enplanements} * \text{Percent Origination} * 2)}{365}$$

#### 4.5.2 Levels of Service (2040)

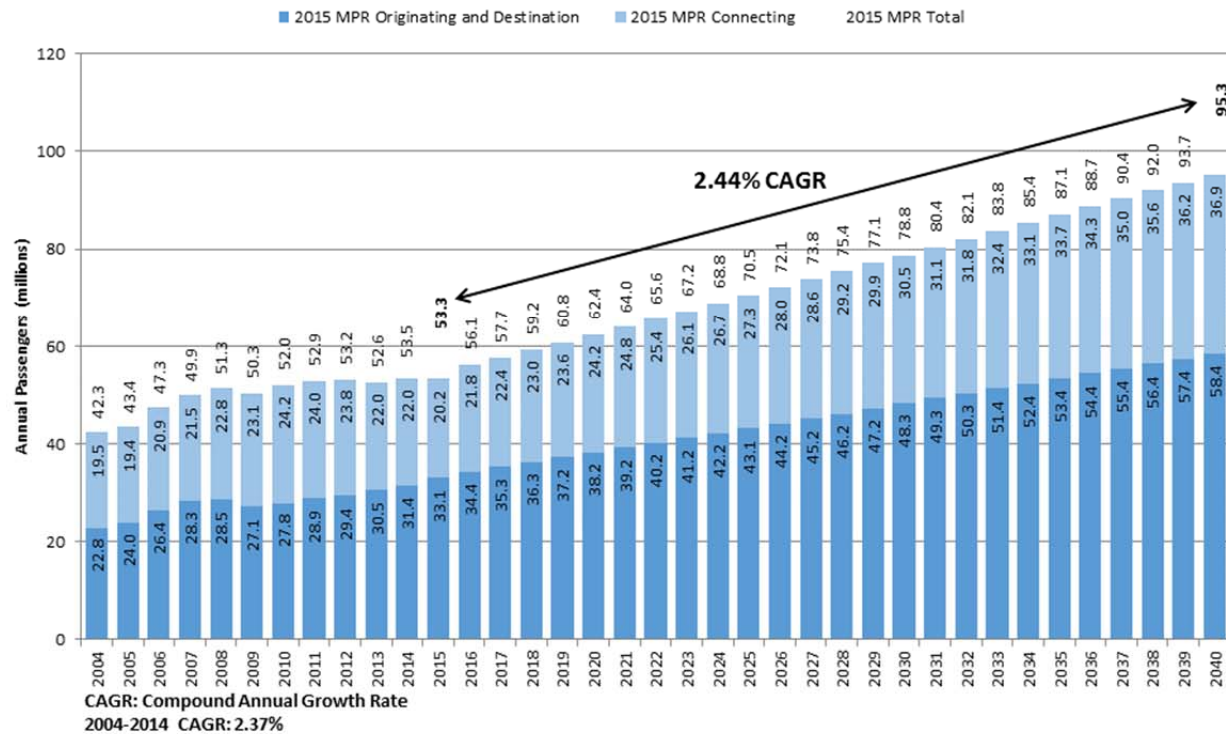
DEN planners performed a sketch planning analysis of traffic growth on Peña Boulevard to assist in discussions with FAA on the likely timeframes for the widening Peña Boulevard. The focus of this analysis was to demonstrate the time horizons for when growth in DEN traffic would trigger the need for capacity improvements. This analysis did not consider the acceleration of capacity improvements required by the addition of non-DEN traffic on Peña Boulevard.

DEN staff used the December 2015 traffic counts obtained from DEN permanent traffic recorders at the airport as a starting point. These traffic counts were factored using the percentage increase in enplanements as suggested by Ricondo's October 2015 Master Plan Refinement forecasts, and were further adjusted to reflect a peak week of airport operation.

Results of the analysis are shown on Table 4-7. As shown, traffic operations on Peña Boulevard due to DEN-generated traffic only degrade on the segments closest to the airport as soon as 2020. By 2040 all segments of the corridor degrade to LOS D or poorer operating levels considering only DEN-generated traffic. The significance of the analysis was to demonstrate that the requirement for widening Peña Boulevard is the result of traffic growth generated by both DEN and non-DEN sources

**Figure 4-11**  
**MPR Forecast Annual Passengers**

## MPR Forecast: Annual Passengers



October 13, 2015

Master Plan Refinement

1

Source: Ricondo & Associates, Inc.

**Table 4-7**  
**DEN Planning's Analysis of Peña Boulevard for FAA**

Draft Airport Traffic Only		Dec-15	2015 DIA	2015 DIA	2015	2020	2020 DIA	2020	2025	2025 DIA	2025	2030	2030 DIA	2030	2035	2035 DIA	2035	2040	2040 DIA	2040
		ADT	Traffic % <sup>1</sup>	Traffic	LOS <sup>2</sup>	% Increase <sup>3</sup>	Traffic	LOS <sup>2</sup>	% Increase <sup>3</sup>	Traffic	LOS <sup>2</sup>	% Increase <sup>3</sup>	Traffic	LOS <sup>2</sup>	% Increase <sup>3</sup>	Traffic	LOS <sup>2</sup>	% Increase <sup>3</sup>	Traffic	LOS <sup>2</sup>
I 70 to 40th Ave	IB	46,987	61%	28,662	B	15.20%	33,019	B	30.40%	37,375	C	45.60%	41,732	C	60.80%	46,089	C	76.00%	50,445	D
I 70 to 40th Ave	OB	45,584	61%	27,806	B	15.20%	32,033	B	30.40%	36,259	C	45.60%	40,486	C	60.80%	44,712	C	76.00%	48,939	D
40th Ave to Green Valley Ranch Blvd.	IB	49,410	61%	30,140	B	15.20%	34,721	C	30.40%	39,303	C	45.60%	43,884	C	60.80%	48,465	D	76.00%	53,047	D
40th Ave to Green Valley Ranch Blvd.	OB	48,741	61%	29,732	B	15.20%	34,251	C	30.40%	38,771	C	45.60%	43,290	C	60.80%	47,809	D	76.00%	52,328	D
Green Valley Ranch Blvd to 56th Ave	IB	49,512	71%	35,154	C	15.20%	40,497	C	30.40%	45,840	C	45.60%	51,184	D	60.80%	56,527	D	76.00%	61,870	E
Green Valley Ranch Blvd to 56th Ave	OB	46,272	71%	32,853	B	15.20%	37,847	C	30.40%	42,840	C	45.60%	47,834	D	60.80%	52,828	D	76.00%	57,821	D
56th Ave to Tower Rd.	IB	46,460	84%	39,026	C	15.20%	44,958	C	30.40%	50,890	D	45.60%	56,822	D	60.80%	62,754	E	76.00%	68,686	E
56th Ave to Tower Rd.	OB	48,022	84%	40,338	C	15.20%	46,470	C	30.40%	52,601	D	45.60%	58,733	E	60.80%	64,864	E	76.00%	70,996	E
Tower Rd. to E-470	IB	44,478	90%	40,030	C	15.20%	46,115	C	30.40%	52,199	D	45.60%	58,284	D	60.80%	64,369	E	76.00%	70,453	E
Tower Rd. to E-470	OB	46,354	90%	41,719	C	15.20%	48,060	D	30.40%	54,401	D	45.60%	60,742	E	60.80%	67,084	E	76.00%	73,425	E
East of E-470 (3 Lanes)	IB	62,826	100%	62,826	C	15.20%	72,376	D	30.40%	81,925	D	45.60%	91,475	E	60.80%	101,024	E	76.00%	110,574	F
East of E-470 (3 Lanes)	OB	61,580	100%	61,580	C	15.20%	70,940	D	30.40%	80,300	D	45.60%	89,660	E	60.80%	99,021	E	76.00%	108,381	F

Notes

<sup>1</sup>DEN Traffic Percentages were taken from 2015 Peña Blvd Corridor Transportation Study

<sup>2</sup>Level of Service (LOS) Based solely on DEN traffic

<sup>3</sup>Traffic percentage increases are based on 2015 Ricondo Origin and Destination Enplanement Forecast





## 5. Alternative Analysis

### 5.1 Initial Alternatives (Universe of Alternatives)

To meet the study's mandate of finding a solution for Peña Boulevard that will satisfy the Airport's FAA grant obligations while ensuring continued access and capacity for Airport use, the study convened a meeting of study stakeholders in early 2014 to review an initial analysis of study area opportunities and constraints and to brainstorm a broad range of physical, operational, financial, and policy alternatives.

Options developed by the stakeholder group are summarized on Table 5-1. As shown, options developed by the group included:

**Physical Strategies:** Widening of Peña Boulevard; new or improved parallel arterials; construction of a collector-distributor road system

**Operational and Financial Strategies:** Tolling of mainline Peña Boulevard and/or interchange ramps; transit service upgrades; regional bicycle facilities

**Policy Strategies:** Land use management; jurisdictional changes to Peña Boulevard; funding districts

**Table 5-1**  
**Universe of Alternatives**

OPTION	SUB-OPTIONS
1   Do Nothing	
2   Close non-Airport Ramps	
2A	No additional roadway improvements
2B	Improve parallel arterials
3   Manage non-Airport Ramps	
3A	Time of day access restrictions (closure)
3B	Toll
4   Widen Peña Boulevard	
4A	No restriction on lane use
4B	Managed lanes for non-Airport traffic
4C	Hard shoulder running during peak periods
5   Collector-Distributor Roads in Peña Corridor to access Aerotropolis area	
5A	No tolls
5B	Tolls
6   Improve Parallel Arterials	
6A	With new connections into DIA
6B	Without new connections into DIA
7   Create Parallel Arterials	
7A	With new connections into DIA
7B	Without new connections into DIA
8   Improve East-West Arterials	
8A	With new connections into DIA
8B	Without new connections into DIA
9   Transit Service Enhancements	
9A	Regional express bus service into Aerotropolis area
9B	Additional FasTracks corridors
9C	Last mile transit circulator system in Aerotropolis area
10   Commuter Bike Facility in Peña Corridor	
10A	Peña only
10B	Peña plus regional connections into Aerotropolis area
11   Land Use Management in 'non-DIA controlled' Aerotropolis Area	
11A	Development restrictions (type, density, magnitude)
11B	Implement trip reduction strategies
12   Infrastructure Funding/Management Alternatives (single or combination of alts)	
12A	Tolls
12B	Tolls with Congestion Pricing
12C	Special Districts
12D	Alternative ownership of Peña Blvd (Denver Public Works)
12E	Alternative ownership of Peña Blvd (CDOT)
12F	Alternative ownership of Peña Blvd (multi-agency owners; authority)
12G	Alternative ownership of Peña Blvd (private concessionaire)
12H	Misc fees (development impact fees, vehicle registration surcharge)
12I	Grants and appropriations (operating funds; capital improvements)
12J	Airport City contributions
12K	FAA changes designation of Peña Blvd to a non-airport road

Source: URS 2013. Note: It is intended that feasible options/sub-options will be later combined into "packages" of alternatives.



## 5.2 Scenarios for Evaluation

Working from the long list of alternatives and options developed by the stakeholder group, eight “scenarios” plus a base condition were formed for development and screening.

- Base Condition (DRCOG 2040 Plan)
- Base Condition with Defined Cost Sharing Mechanism
- Exclusive Driveway to DEN (close non-airport ramps)
- Toll Peña Mainline and Ramps
- Toll Peña Ramps
- Collector-Distributor Roadway
- Parallel Roadway Corridors (Buckley, Tower)
- Toll Peña Ramps and Free E-470 for Airport Users
- Enhanced Regional System

As described in the following sections, each scenario was defined in terms of:

- Physical or Operational Elements that are required to implement the alternative, including roadway and multimodal improvements. Financial responsibility to implement the physical/operational improvements, concept-level costs, and candidate funding sources were identified.
- Financial and/or Institutional Elements that are required including land use management tools, new intergovernmental agreements, and likely governance or jurisdiction changes.

Detailed Screening is shown in Appendix C.

## 6. Implementation Strategy

### 6.1 Tower Road On-Ramp Cost Sharing Strategy

To accommodate airport and non-airport traffic using Peña Boulevard corridor and ramps at the interchanges, a cost sharing strategy was applied between DEN and surrounding municipalities. The intergovernmental agreement occurred between the City and County of Denver and Commerce City in the Tower Road Ramp construction in 1992 and 1999. The two east side ramps at the Tower Road and Peña Boulevard interchange have been constructed and funded by the City and County of Denver and Commerce City. Denver Public Works built the third ramp (off-ramp from eastbound Peña Boulevard to Tower Road).

In April 2015, there was an amendment agreement regarding the fourth ramp (Tower Road to westbound Peña Boulevard) that required FAA approval. During this study period, this agreement was approved by the FAA and determined to be an acceptable model for funding Peña relative to non-airport traffic. This could be a possible interim solution, because for the first time the percentage of airport and non-airport traffic was determined and used for funding allocation.

The Tower Road On-Ramp Cost Sharing Strategy is included as Appendix D.

### 6.2 FAA Policy

During the preparation of this final report, DEN executive management received correspondence from the FAA Associate Administrator for Airports (see Appendix E) that potential expands DEN's options for funding needed improvements to Peña Boulevard. In their letter, FAA advised that they would consider further discussions about using airport revenues to fund the prorated costs of the expansion of Peña Boulevard. This modifies FAA's previous policies that limited the use of airport revenues for the improvement of facilities that serve both airport and non-airport users.

Discussions with FAA concerning the implementation of this policy for the programming of Peña Boulevard improvements, including agreement on the percent of prorata funding for improvements, are continuing. Alternative funding sources are required to address capacity improvements warranted by non-airport traffic demand.

### 6.3 AIM Phasing Plan and Implementation Schedule

In the Spring of 2016, DEN's Airport Infrastructure Management Planning and Development unveiled a \$2 billion capital improvement program for airside and landside improvements at DEN. The program includes a four-phase improvement plan for the Peña Boulevard corridor to be implemented over 10 years at a concept-level cost of \$400 million.

The proposed improvement phases include:

Phase 1: Relocate and reconstruct inbound and outbound Peña Boulevard from Jackson Gap Street to the Terminal (3.5 miles). Phase 1 can be paid for with 100% airport funds as all improvements are east of E-470 which the FAA has agreed to be considered 100% airport traffic.

Phase 2: Widen inbound and outbound Peña Boulevard by one additional lane from I-70 to 64<sup>th</sup> Avenue (7.5 miles)

Phase 3: Widen inbound and outbound Peña Boulevard by one additional lane from E-470 to Jackson Gap Street (2.2 miles)

Phase 4: Widen inbound and outbound Peña Boulevard by one additional lane from 64<sup>th</sup> Avenue to E-470 (4 miles)

A design-build contractor will be selected for the first phase project. DEN also has retained a consultant team for a 10-year contract to manage the design and construction of the Peña Boulevard widening and reconfiguration projects.

## 6.4 Next Steps

The next step activities to continue the implementation of Peña Boulevard corridor improvements include:

1. Finalize negotiation with the FAA on an airport/non-airport funding amount for Peña Boulevard expansion and maintenance based on airport/non-airport traffic split.
2. Identify sources and secure funding for addressing capacity improvements warranted by non-airport traffic demand. Possible funding sources identified to date include:
  - DRCOG FHWA TIP funding as identified in the RTP
  - FHWA TIGER Grant funding
  - FHWA Fastlane Grant Program (now INFRA)
  - National Highway Freight Program Grants offered through CDOT

Each of these sources is described further in the following narrative.

### 6.4.1 DRCOG FHWA TIP Funding

Widening of Peña Boulevard is included in the Metro Vision 2040 Regional Transportation Plan (2040 Metro Vision RTP, see Figure 4-9 of this report). Developed by DRCOG, the 2040 Metro Vision RTP is the Denver region's comprehensive guide for development, transportation, and environment.

Funding of projects that are included in the 2040 Metro Vision RTP is coordinated through DRCOG's Transportation Improvement Project (TIP) process. The TIP process identifies a six-year program of projects that will be eligible for federal funding considering program fiscal constraints. Projects are selected through a competitive process that considers the level of traffic congestion on the roadway, potential for crash reduction, multimodal connectivity, among other considerations.

Funds can be used for design fees, environmental clearance processes, right-of-way acquisition, and construction. Currently, project sponsors are required to commit a minimum 20% match of the federal funds from local/state financial resources.

DRCOG is currently developing the project application requirements for the next call for projects, including the program budgets. Applications typically require a detailed description of the proposed project, conformance of the project to regional goals and objectives, detailed assessment of project benefits and costs, and a project financial analysis. In the past, DRCOG member jurisdictions have been limited on the number of projects that can be submitted for consideration.

The next call from DRCOG for TIP project nominations is expected in 2018. DRCOG is considering a two-stage call for projects. The initial call would be nominations for “regional” projects. Regional projects “connect communities; improve mobility and access, while providing a high return on investment to the region consistent with Metro Vision and the Regional Transportation Plan.”

Later, a call for “subregional” project would be issued. Subregional projects are those identified and recommended by eligible stakeholders within a defined subregion (such as a county).

The 2018 call for projects protocol has not, as of the writing of this report, been finalized. As a result, there has been no determination as to which project category (regional or subregional) Peña Boulevard corridor project nomination(s) might be assigned.

A tentative schedule of events for the call for projects is included in Table 6-1.

**Table 6-1**  
**2018 Call for Projects Schedule of Events**

<b>Date</b>	<b>Milestone</b>
2017	DRCOG’s policy group determines the process for the nominating and selecting the next round of projects
February 2018	Formal call for regional projects (eight week response period)
April 2018	Formal evaluation of submitted regional projects by DRCOG task force (subset of DRCOG Board)
May 2018	Task force recommendation (regional projects) to full DRCOG Board
By July 2018	Formal call for subregional projects( 4+ week response period)
By October 2018	Subregional project recommendations submitted to DRCOG Board for consideration
November 2018	Board action on regional and subregional projects
February 2019	Public hearing on the 2020-2023 TIP
March –April 2019	DRCOG Board approval of the TIP

#### 6.4.2 FHWA Tiger Grant Funding

The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program began in 2009 and provides funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs, including highway or bridge projects eligible under Title 23 (including bicycle and pedestrian-related projects), public transportation projects eligible under Chapter 53 of Title 49, passenger and freight rail transportation projects and port infrastructure investments (including inland port infrastructure).

Recent awards have focused on capital projects that generate economic development and improve access to reliable, safe and affordable transportation for communities, both urban and rural. The program is now in its eighth round and demand has consistently exceeded available funds, so average grants are under \$15 million. The minimum award is \$1 million for projects located in rural areas and \$5 million for projects located in urban areas. The maximum award is \$100 million and no more than \$100 million may be awarded to projects in a single state.

Evaluation criteria include project alignment with USDOT long-term priorities, status of local partnerships, innovation in terms of design, technology, project delivery or financing, leverage of non-federal revenues, and timing and meeting of the federal funding deadline. Projects are selected based on whether the project promotes state of good repair, economic competitiveness, quality of life and environmental sustainability.

The current Federal Administration does not support the TIGER Grant program and has defunded the program in the FFY18 budget.

#### 6.4.3 FHWA Fastlane Grant Program (now INFRA Grants)

The Department of Transportation (USDOT) announced the Infrastructure for Rebuilding America (INFRA) discretionary grant program through a Notice of Funding Opportunity (NOFO) in the Federal Register on June 29<sup>th</sup> 2017. The INFRA program will make approximately \$1.5 billion available to projects, including freight, in FFY17 and FFY18. Eligible INFRA project costs may include: reconstruction, rehabilitation, acquisition of property (including land related to the project and improvements to the land), environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance. Projects must be ready to proceed rapidly to construction.

INFRA advances a pre-existing grant program established in the FAST Act of 2015 and utilizes updated criteria to evaluate projects to align them with national and regional economic vitality goals and to leverage additional non-federal funding. The new program will increase the impact of projects by leveraging capital and allowing innovation in the project delivery and permitting processes, including public-private partnerships. Fastlane applicants must reapply under the new criteria.

INFRA grants may be used to fund a variety of components of an infrastructure project, however, USDOT is specifically focused on projects in which the local sponsor is significantly invested and is positioned to proceed rapidly to construction. USDOT will make awards under the INFRA program to both large and small projects, with a minimum total project cost of \$100 million. For a large project, the INFRA grant must be at least \$25 million. For a small project, the grant must be at least \$5 million. For each fiscal year of INFRA funds, 10% of available funds are reserved for small projects. The INFRA grant program preserves the statutory requirement in the FAST Act to award at least 25% of funding for rural projects.

#### 6.4.4 National Highway Freight Program Grants Offered Through CDOT

On December 4, 2015, the Fixing America's Surface Transportation (FAST) Act was signed, reauthorizing the Federal surface transportation programs for five fiscal years (FYs 2016-2020). The FAST Act established the National Highway Freight Program (NHFP). The act also provides \$6.3 billion in formula funds over the five years for states to invest in freight projects on the National Highway Freight Network. Up to 10 percent of these funds may be used for intermodal projects. NHFP funds are available for obligation for up to 4 years (three years after the last day of the fiscal year for which the funds are authorized). The federal share for NHFP is generally 80 percent, subject to the upward sliding



scale adjustment for projects incorporating innovative delivery methods or states containing public lands. The federal share for projects on the Interstate system, (other than those that add lanes that are not high-occupancy-vehicle or auxiliary lanes) is 90 percent (subject to the upward sliding scale adjustment). For projects that add single occupancy vehicle capacity, the portion of the project that increases single occupancy vehicle capacity will revert to the 80 percent Federal share participation level. Certain types of improvements (predominantly safety improvements) may have a Federal share of 100 percent. The Federal share for projects that are located on toll roads is limited to 80 percent. States may choose to use a lower Federal share on Federal-aid projects. The National Highway Freight Program is anticipated to provide approximately \$15 million (federal] annually to Colorado through FFY 2020.

**Recommendation to DEN for Funding:** Based on the program criteria described above, USDOT INFRA funding and FHWA funding through the DRCOG TIP process appear to be best suited for funding costs associated with non-airport traffic on Pena Boulevard.

# Appendix A – Summary of Existing Planning Documents

## Denver International Airport Reports/Studies

*Conceptual Drainage Study and Technical Appendix for the New Denver Airport*, Stapleton Joint Venture (October 1988 and December 1988): This study includes hydrologic and conceptual drainage planning for the four major drainage basins located within the new Denver airport site. Peak runoff rates were determined for the 2- and 100-year recurrence intervals. Capital cost projections for the proposed drainage system were also prepared.

*New Airport Master Plan Study, Phase I Off-Airport Access Plan*, Felsburg Holt & Ullevig (October 1988): This study report documents the roadway needs for the initial 25 million annual passenger enplanement level of projected airport activity, the Phase I level projected at opening around the year 1995. The report identifies roadway improvements to accommodate the initial 25 million annual passenger enplanements, with the ability to expand to accommodate 55 million annual enplanements.

*New Airport Master Plan Study, Long Range Off-Airport Access Plan*, Felsburg Holt & Ullevig (October 1988): This purpose of this study is to identify major roadway and transit facilities that could accommodate groundside travel demand between the proposed airport site and the Denver metropolitan area.

*New Denver Airport Environmental Assessment, Volume I*, City and County of Denver (CCD)(November 1988): This document addresses the environmental impacts anticipated by the construction and operation of the new airport. The proposed development includes the acquisition of land necessary to construct and operate: the airport complex, on- and off-site areas for air navigation facilities, and ground transportation facilities to access and serve the new airport. A specific item of action includes the “construction of roads, highways, or other ground transportation facilities designed to provide access to and serve the new airport, and the integration of these roads into the existing road systems in the area.”

*Airport Boulevard Corridor Assessment*, (1989): The document analyzes the proposed Airport Boulevard (ultimately Peña Boulevard) alignment alternatives. Future year traffic forecasts are presented to aid in the selection of the preferred alternative for roadway alignment.

*New Denver Airport Final Environmental Impact Statement (FEIS), Volumes I & II, Appendices, and Record of Decision*, U.S. Department of Transportation, Federal Aviation Administration (1989): These documents address the environmental impacts anticipated by the construction and operation of a new transport category airport and associated federal actions. The FEIS also indicates the secondary development expected to be induced as a result of development of a new airport. The FEIS includes the “environmental impacts expected to occur as a result of highway development related to the airport, particularly those impacts related to what has been identified as the transportation corridor and interchanges with existing highway facilities, which are directly related to the airport development project.”

*Transportation Control Measures and Air Pollution Mitigation: Planning for the New Denver Airport*, Spensley & Associates, Ltd. (February 1989): This report provides an overview of forward-thinking air quality planning alternatives for mitigation of a major new indirect air pollutant source. Mitigation measures considered in the assessment include airport-specific and region-wide transportation control measures. Measures aimed at reducing vehicle miles traveled include capital improvements such as mass transit and systems management such as toll roads and parking allocation programs.

*Conceptual Design of Airport Boulevard*, Greiner, Inc. (April 1989): These sheets show typical cross sections, drainage crossings, and plan/profiles for the proposed interchanges on Airport Boulevard.

*Denver International Airport (DEN) Drainage Masterplan, Part Two, Analysis of 5-Year Development Plan*, Final Report, Martin/Martin Consulting Engineers (December 2003): The report provides updated analysis based on the Part One improvements completed, accounts for the anticipated 5-year planned Airport developments, and evaluates and makes recommendations with regard to required drainage facilities.

*Denver International Airport Drainage Masterplan, Part Three, Analysis of Full Development Plan*, Final Report, Martin/Martin Consulting Engineers (June 2004): This third and final report modifies the analyses and makes recommendations based on the anticipated full development of the Airport based on the proposed Airport Layout Plan (ALP) and the current On Airport Land Use Plan.

*Peña Boulevard Corridor Management Policy*, (June 8, 2005): This paper establishes the policies governing transportation project development in the Peña Boulevard corridor between Himalaya Road and I-70. The document touches on the purpose of the corridor, transportation improvements within the corridor, criteria for development of other uses, and other considerations for development. Attached exhibits show the corridor, scenic buffer, FasTracks commuter rail alignment, and proposed Peña collector-distributor roadway system.

*Peña Boulevard, 40<sup>th</sup> Avenue through Tower Road, Collector – Distributor Road Concept*, Felsburg Holt & Ullevig (October 2007): This pdf map (accompanied by dwg files) of the corridor shows the Collector – Distributor Road Concept with key maps indicating figure numbers for additional details.

*Denver International Airport Phase II Master Plan Studies, Facility Requirements*, (excerpts) Ricondo & Associates, Inc. (February 2008): These portions of the study consider landside facility requirements, curbside roadway analysis, roadway demand estimates, potential roadway improvements, intersection analysis, and commercial ground transportation and staging demand/capacity and requirements.

*Tower Road/Peña Boulevard Interchange Denver International Airport*, (Briefing Paper), (July 31, 2009): This two-page document includes bullet points summarizing the issues and history of the interchange.

*Airport Layout Plan – Narrative Report*, Denver International Airport, City and County of Denver, Department of Aviation (April 2011): The ALP is a collection of 42 Airport drawings that serve as a record of existing aeronautical requirements, and as a reference for deliberations on land use proposals, zoning, and budget resource planning for Denver International Airport. The drawings were prepared to illustrate the conclusions of the Master Plan update; they show the existing airport with a depiction of those facilities and areas that are identified for future development to meet the forecast growth in aviation and related activity. Two important drawings include:

- ALP 03: Airport Layout Plan
- ALP 07: On Airport Land Use Plan

Excerpt from *DEN Master Plan Update Studies Phase II, Facility Requirements*, Ricondo & Associates, Inc. (June 2011): This excerpt considers the effects of rail ridership on airport roadways and parking facility requirements.

*DIA Master Plan Update Studies Phase I, Volume 2*, Ricondo & Associates, Inc. (June 2011): This volume documents the second portion of the Master Plan Update Studies. It includes detailed discussions of passenger security checkpoints, roadway curbsfronts, FasTracks station integration, and the terminal expansion plan.

*Peña Boulevard Traffic Study Policies and Issues*, White Paper, Denver International Airport (July 15, 2011): This document is a bulleted list of facts and background data related to Peña Boulevard and the traffic study.

*Denver International Airport Master Plan Update Studies, Executive Summary*, City and County of Denver, Department of Aviation (March 2012): This document provides an overview of the findings and recommendations from the Master Plan Update Studies. The original Master Plan for the airport was completed in the late 1980s. The City and County of Denver, Department of Aviation, initiated the update process in late 2006. The updated Master Plan “provides a road map for efficiently accommodating aviation demand through the foreseeable future while preserving the flexibility necessary to respond to evolving industry conditions, the regulatory environment, and the characteristics of airport activity.”

*Denver International Airport, Airport City Development Strategy Document*, MXD Development Strategists, et al. (April 2012): The document describes results of an assignment to leverage DEN’s large land assets and explore its potential to create the DEN Airport City. Key to stimulating economic development through the Aerotropolis is providing the necessary balance of land uses and activities within the Airport City, which is located near the terminal gateway. Land along Peña Boulevard, Peña Minor, is noted for its good visibility and accessibility; however, the report mentions that most of the land associated with Peña Minor is constrained by limitations set out in the intergovernmental agreement (IGA) between the City and County of Denver, the State of Colorado, and Adams County. Recognizing these limitations, the Denver Airport City Commercial Development Plan should nevertheless make significant efforts to benefit from these lands, weaving in regional economic clusters and traditional airport city uses wherever permissible.

*Peña Boulevard Task Force Draft Proposal*, (April 13, 2012): This document provides details on the establishment of a mayoral appointed taskforce to “evaluate options for Peña Boulevard based on the findings of the DEN traffic study conducted over the last 12 months, input from the Federal Aviation Administration (FAA) and national comparisons.”

*Peña Boulevard Corridor Data Collection and Travel Demand Analysis, Revised Final Study Report*, Felsburg Holt & Ullevig (October 2012): This report contains traffic data and travel demand analysis for the Peña Boulevard corridor between I-70 and DEN. The purpose of the study was to inventory the existing vehicle traffic using Peña Boulevard for airport and non-airport related travel and to forecast future traffic usage on Peña Boulevard to the year 2035.

*Peña Boulevard – Regional Ground Transportation Plan Initiative*, (no date): This document outlines potential short-term and long-term solutions to the airport’s “non-conformance” with federal grant covenants due to free use of Peña by non-airport users. It also mentions related planning efforts: Airport City Denver and the Aerotropolis.

## Denver International Airport Presentations

*Peña Boulevard Analysis, Denver International Airport Financial Planning and Analysis*, (March 5, 2012): This presentation outlines traffic demand projections and maintenance costs; recommends creation of a unique cost center for Peña Boulevard to permit more accurate cost tracking and analysis.

*Peña Boulevard Analysis, Denver International Airport Financial Planning and Analysis*, (April 17, 2012): This presentation outlines traffic demand projections and maintenance costs; recommends creation of a unique cost center for Peña Boulevard to permit more accurate cost tracking and analysis.



*Peña Boulevard Corridor Traffic Data and Travel Demand Analysis Study*, Felsburg Holt & Ullevig (May 4, 2012): This presentation outlines data collection, traffic forecasts, the process to identify current and future users, existing data traffic volumes, year 2035 daily traffic forecasts, origin-destination areas, and start and end locations for Peña Boulevard north of 56<sup>th</sup> Avenue from Bluetooth data.

*Airport Finance 101*, Denver International Airport (May 18, 2012): This presentation outlines the legal framework and management for the airport, drivers of the airport's financial performance, the flow of annual operating funds, types of operating costs, types of revenues, sources of revenue, capital funding sources, annual debt service payments, discretionary cash, airline use and lease agreements, airline rates and charges, airline revenue credit, and airline operating costs per enplanement.

*Peña Boulevard Task Force Case Studies*, Daniel S. Reimer, Kaplan Kirsch & Rockwell LLP, (June 2012): This presentation outlines case studies from Albany, Dulles, San Francisco, Portland, and Minneapolis.

*Peña Ramp and Methodology*, Denver International Airport (April 10, 2013): This presentation begins with a summary table of FAA guidance on Peña Boulevard related revenue diversion. It then shares highlights from the Felsburg Holt & Ullevig traffic study (2011 data) and provides cost estimates for operations and maintenance (O&M) and new lanes. The calculations show the possible additional annual O&M expenses due to a new ramp, as well as the possible costs to other jurisdictions if an additional lane is required. Finally, the presentation suggests topics for further analysis and offers a flow chart detailing the steps to identify Peña Boulevard costs, allocate among airport and non-airport users, and project future demand.

## Denver International Airport Intergovernmental Agreements

*Intergovernmental Agreement on a New Airport*, between the City and County of Denver and Adams County (April 21, 1988): This agreement describes land annexation, airport configuration, land uses, transportation, and noise issues, among others, for the development of an airport to replace Stapleton International Airport.

*Inter-Departmental Memorandum of Understanding (MOU) for Peña Boulevard Trail*, between the City and County of Denver's Department of Parks and Recreation and Department of Aviation (May 18, 2000): This agreement articulates plans for developing a hard-surface public pathway within the Peña Boulevard corridor between 40<sup>th</sup> Avenue and Bolling Drive, for use by pedestrians, bicyclists, and other recreational users.

*Interdepartmental Memorandum of Understanding Regarding Drainage Detention Ponds in the Peña Boulevard Corridor*, between the Department of Public Works and the Department of Aviation (May 1, 2003): The MOU grants Public Works a revocable permit to access pond sites for design and construction.

*Inter-Departmental Memorandum of Understanding Regarding Green Valley Ranch Boulevard Widening*, between the Department of Aviation and the Department of Public Works (October 4, 2011): This MOU details plans to widen a portion of Green Valley Ranch Boulevard that crosses under the Peña corridor.

## Other Plans/Reports

*The Emerald Strands: A Cooperative Park, Open Space, and Trail Plan for the Area Surrounding the new Denver International Airport*, Prepared by Parks, Planning, and Gateway Development Staffs of Adams County, Aurora, Brighton, Commerce City, and Denver (February 1990): This plan anticipates significant development in the airport environs (in Adams County, Aurora, Brighton, Commerce City,

and Denver) and proposes an “emerald strand of parks, trails, and recreational sites” to form a trail and open space system connecting the Highline Canal with the Platte River Greenway.

*Rocky Mountain Arsenal National Wildlife Refuge Comprehensive Management Plan*, U.S. Fish and Wildlife Service (March 1996): The plan outlines a vision for development of the refuge and specifies how it will conserve wildlife while providing enjoyment to people.

*Revision to the First Creek and DFA 0055 Outfall Systems Masterplan (Picadilly Road to Buckley Road)*, Martin/Martin, Inc. (November 18, 1998): This report was presented to the Urban Drainage & Flood Control District and was sponsored by Gateway Regional Metropolitan District, which represents properties within the City and County of Denver along Tower Road from approximately 50<sup>th</sup> Avenue to 72<sup>nd</sup> Avenue. As an alternative to the Bald Eagle Shallows primary regional detention facility, the Master Plan proposes using smaller sub-regional detention spread throughout the basin to allow for phasing of development and to minimize improvement costs for channels and crossings.

*Denver Storm Drainage Master Plan Report*, Matrix Design Group, Inc. (April 2005): The report updates the 1989 Storm Drainage Master Plan and serves as the framework for management of stormwater programs and implementation of capital improvements within the City. The update includes new information available via geographic information systems (GIS), land use master plans, and Public Works Department stormwater sections. The update process included all of the City and County of Denver and provides a detailed evaluation of hydrologic conditions and conceptual-level design of drainage improvements.

*Second Creek Greenway Master Plan*, The Greenway Team: Urban Edges Inc./DHM Design (Autumn 2005): This plan was prepared for the Win-Win Trails and Open Space Coalition. It is intended to guide the development of a 17.3-mile multi-use trail and greenway along the length of Second Creek through the Northeastern Metro Area—linking The Platte River Greenway to the Highline Canal Trail. The document provides planning and design standards, trail layout, cross sections, component details, maintenance procedures and cost estimates. The proposed trail alignment crosses the Peña Boulevard corridor just west of Tower Road.

*Denver Strategic Transportation Plan, Gateway Travel Shed Evaluation*, Felsburg Holt & Ullevig (April 26, 2007): This report provides an analysis of a proposed roadway, transit, and bicycle/pedestrian network for the Gateway Travel Shed based on two future growth scenarios (year 2030 and buildout). The plan includes traffic forecasts with the Peña Boulevard Concept Plan, a collector-distributor system to help to alleviate the level of local traffic using the Peña Boulevard mainline.

*Denver Strategic Transportation Plan, Gateway Travel Shed Evaluation*, (excerpt) (April 26, 2007): This portion of the plan contains analysis of the Peña Boulevard Corridor, providing year 2005 and projected year 2030 traffic characteristics. The plan concludes that demands on the corridor will require transportation alternatives by approximately year 2020.

*Aurora Northeast Area Transportation Study Update*, Felsburg Holt & Ullevig (July 2007): This study covers an area north of Jewell Avenue and east of Picadilly Road. It addresses existing and future land use projections, travel demand levels for year 2030, the development of a multi-modal transportation system, and the physical characteristic of the future arterial roadway network.

*Tower 160, Filing 1 Traffic Impact Study*, Prepared for Oakwood Development, David Evans and Associates, Inc. (April 2008): This study addresses the transportation needs associated with the proposed Tower 160, Filing 1 development located north of 48th Avenue and west of Tower Road in Denver, Colorado. The site is located west of the Green Valley Ranch Town Center and north of The Denver Connection development.

*56th Avenue Corridor Study*, URS (July 2008): This study looks at an approximately 4.5-mile long section of 56th Avenue along the City and County of Denver border from Havana Street to just east of

Peña Boulevard. It evaluates existing and future traffic and safety conditions along the corridor, and presents a set of feasible transportation improvement measures that will enable the corridor to effectively serve future traffic demand.

*Moving People: Denver Strategic Transportation Plan*, (October 2008): The plan vision is to create a multimodal transportation system to support a livable, connected and sustainable city. The plan identifies 12 travel sheds in the city, including the Gateway travel shed that encompasses most of the Peña Boulevard corridor.

*I-70 East Draft Environmental Impact Statement (DEIS) Executive Summary*, (November 2008): This chapter from the DEIS outlines proposed improvements to the I-70 Corridor where it traverses northeast Denver from I-25 on the west to Tower Road on the east. According to the project purpose and need, “The purpose of the project is to implement a transportation solution that improves safety, access, and mobility and addresses congestion on I-70.” A detailed table summarizes the impacts and mitigation measures for the various alternatives.

*RTD East Corridor Final Environmental Impact Statement, Executive Summary*, (September 2009): This chapter from the FEIS summarizes the purpose and need for the project: “to provide high-capacity, fixed-guideway transit that improves transportation access and mobility between downtown Denver and DEN, with connections to the rest of the RTD transit system...” A lengthy table summarizes the impacts and mitigation for the preferred alternative.

*RTD East Corridor Final Environmental Impact Statement, Volumes I and II*, (September 2009): This full FEIS contains all chapters and appendices: Executive Summary; Purpose and Need; Alternatives Considered; subsections dealing with Affected Environment, Environmental Consequences, and Mitigation; Transportation Systems; Financial Analysis; Public and Agency Coordination; Section 4f Evaluation; and Response to Agency and Public Comments. The FEIS describes transportation and environmental impacts associated with transit improvements in the East Corridor. The Preferred Alternative includes 22.8 miles of commuter rail from Denver Union Station (DUS) to DEN. The Preferred Alternative is evaluated against the other alternatives through a variety of categories including: social and community facilities; land use, zoning, and economic development; land acquisition, displacements, and relocations; historic, archaeological, and cultural resources; parklands and recreation areas; air quality; energy; noise and vibration; biological resources; natural resources; hazardous materials; and safety and security.

*RTD East Corridor Final Environmental Impact Statement, Purpose and Need*, (September 2009): This chapter from the FEIS describes the project, area, and history; other related studies; the planning context; the FasTracks plan; the EIS process and decision framework; the transportation need; and project goals and objectives.

*RTD East Corridor Record of Decision*, (November 2009): The Federal Transit Administration (FTA) has determined that the requirements of the National Environmental Policy Act have been met for the East Corridor project. The Preferred Alternative consists of an electric multiple unit (EMU) commuter rail train and track system between DUS and DEN, located 23 miles northeast of downtown Denver. The alignment follows the Union Pacific Railroad (UPRR) corridor between DUS and Airport Boulevard and then heads north and east to DEN. The East Corridor Preferred Alternative alignment will operate on a double-track system using a combination of UPRR right of way (ROW), private property, and shared CCD and City of Aurora ROW. The new track will not be shared with existing or planned freight rail operations.

*Harvest Road Technical Report*, (February 25, 2010): This document details the need for Harvest Road, a new major north-south arterial route between I-70 and DEN, to provide improved traffic operations to and from DEN as well as the Northeast Aurora area.

*First Creek (Upper) Digital Flood Hazard Area Delineation*, Moser & Associates Engineering (May 2010): This report contains Major Drainageway Planning (MDP) and the Flood Hazard Area Delineation (FHAD) Study for the First Creek (Upper) Drainageway watershed. First Creek flows in a northwest direction from approximately the intersection of Watkins Road and Yale Avenue to an outfall on the South Platte River just south of 120th Avenue. The downstream study limit for the First Creek (Upper) study area is Buckley Road. The study area is approximately 30.6 square miles.

*Commerce City C3 Vision (Comprehensive Plan)*, Clarion Associates, Felsburg Holt & Ullevig, and BBC (May 1, 2010): This C3 Vision Plan addresses immediate needs and anticipates long-term future needs (year 2035 and beyond). It is designed to guide the growth and development of the city and recommend programs for services and infrastructure. According to the plan's vision, "Commerce City will have a robust economy, drawing on its strength as a business-friendly city. It will have a quality natural and built environment with great neighborhoods, parks, and places in which to live, work, and play safely. The community will celebrate its culture and history, and promote conservation and stewardship of resources for present and future generations."

*Commerce City C3 Vision, Transportation Plan*, Felsburg Holt & Ullevig (July 12, 2010): The plan links transportation and land use growth with numerous strategies aimed toward developing a balanced and sustainable community. It builds on the existing transportation network and determines what improvements are needed to realize the multimodal vision for the future of Commerce City.

*Green Valley Ranch Blvd/Peña Blvd Interchange – Traffic Analysis Memorandum*, David Evans and Associates, Inc. (August 8, 2010): This memo presents the traffic engineering analyses and design recommendations for the Green Valley Ranch Boulevard/Peña Boulevard interchange in the City and County of Denver as part of the conceptual design to widen this section of Green Valley Ranch Boulevard to four lanes in the interim condition (six-lanes ultimate condition).

*Commerce City Future Land Use Plan* (Comprehensive Plan Figure 3.2), Clarion Associates, Felsburg Holt & Ullevig, and BBC (September 27, 2010): This map identifies the intergovernmental agreement growth boundary, DEN noise contours, 100-year floodplain, future roads, planned transit stations, future transit lines, existing/future school sites, activity centers, and future land use.

*Baseline Hydrology Report Second Creek (Upstream of Denver International Airport) Major Drainageway Plan*, Olsson Associates & Matrix Design Group, Inc. (October 2010): This report provides updated baseline hydrology for Second Creek and the Possum Gully and Gopher Gulch watersheds. The watershed is primarily undeveloped and the MDP will be used as a guide as development occurs.

*Metro Vision 2035 Plan*, Denver Regional Council of Governments (February 16, 2011): This plan is part of DRCOG's regional Master Plan for the Denver region. It deals with growth and development, transportation and environment. A key goal of the plan is to accommodate 50% of new housing and 75% of new employment in urban centers between year 2005 and year 2035. The plan supports a robust multimodal transportation system and acknowledges Colorado's transportation funding deficit, which fiscally constrains the plan.

*40<sup>th</sup> Avenue Station Traffic Impact Study*, Prepared for Sand Creek Metropolitan District, Kimley-Horn and Associates, Inc. (March 2011): The purpose of this study is to assess and evaluate access to developable DEN property located east of Airport Boulevard between Interstate 70 and E. 40th Avenue in the City of Aurora, Colorado. The property is adjacent to the proposed East Corridor rail project and the Gateway Park property. This study considered property access in conjunction with the planned lowering of E. 40th Avenue below the East Corridor railroad tracks and the development of the Gateway TOD area and DEN properties.

*Walk. Bike. Fit: Commerce City – A Multi-Modal Active Transportation Plan*, DHM Design Corporation and the Greenway Team, Inc. (January 2012): This document puts forth a vision and plan for a more



walkable and bikable-friendly Commerce City. To accomplish this, the plan recommends specific alignments for a citywide/regional greenway and trail network, overcoming physical barriers to safe, pleasant active travel.

*Adams County Open Space, Parks & Trails Master Plan, Design Workshop* (November 16, 2012): The plan identifies corridors for trail development and open space conservation that link to the open space systems of adjacent counties and communities while retaining the natural, cultural, and agricultural qualities of the County.

*Imagine Adams County Transportation Plan and Appendix A: Transportation System Profile Maps, Felsburg Holt & Ullevig* (December 2012): The multi-modal transportation plan guides the implementation of transportation expansions and upgrades through the year 2035. A key objective of the Plan is to coordinate the independently produced transportation plans of the participating cities to ensure compatibility and an effective implementation strategy for regional improvements.

*Imagine Adams County Comprehensive Plan, Clarion Associates, Felsburg Holt & Ullevig, Dewberry Consultants, LLC, and Economics and Planning Systems* (December 2012): As the policy document for Adams County, the plan provides a concise statement of objectives for future development within unincorporated areas and in municipal growth areas. The philosophical basis of the plan is to create a more sustainable and resilient Adams County.

*Porteos Master Plan Development Proposal, Traffic Impact Study Addendum, Felsburg Holt & Ullevig* (April 15, 2013): This letter-report is intended to address development plan adjustments made to the Porteos Master Plan since the completion of the master traffic impact study in May of 2012. The specific changes pertain to the northwest corner of the Master Plan near 68<sup>th</sup> Avenue and Harvest Road, where roadway alignment modifications connecting to Jackson Gap Street to the north have taken place.

*61<sup>st</sup> & Peña Station Area Plan, Planning Board Draft, (November 20, 2013):* According to the plan, “Development at this particular station is important in shaping the future of the airport and the northeast quadrant of the metropolitan area. As a greenfield area, the 61<sup>st</sup> and Peña transit community has the opportunity to showcase the best in transit-oriented development.” Immediately north of Gateway/Green Valley Ranch, the conceptual land use map covers 382 acres east of the Peña transportation corridor.

## Other Governmental Agreements

*Memorandum of Understanding Regarding Tower Road Interchange, between the City and County of Denver and the City of Aurora* (February 6, 1991): The MOU clarifies agreements related to I-70/Airport Boulevard/Buckley Road; Airport Boulevard/64<sup>th</sup> Avenue/Tower Road; Tower Road; E-470; Picadilly Road Grade Separation; and the Transit Alignment.

*Intergovernmental Agreement Regarding Airport Boulevard Interchange, between the State Department of Transportation and the City and County of Denver* (January 9, 1992): This IGA provides for State approval and City funding for the interchange.

*Intergovernmental Agreement Regarding Coordination of Road Improvements and Operations, between E-470 Public Highway Authority and Commerce City* (January 27, 1995): In this agreement, the Authority agrees to complete construction of the section of E-470 north of Peña Boulevard to 120<sup>th</sup> Avenue with interchanges at 96<sup>th</sup> Avenue and 104<sup>th</sup> Avenue, and grade separations at 88<sup>th</sup> Avenue, 112<sup>th</sup> Avenue, and Tower Road. A provision of the agreement states that, “In the event the west ramps of the Tower Road/Peña Boulevard interchange have not been constructed by January 1, 2012, and upon the request of the City, the Authority agrees to construct... at no cost to the City, the west ramps...” Further, the Authority agrees to reimburse the City for up to \$1.3 million of the cost of constructing the east ramps of the Tower Road/Peña Boulevard interchange.



*Intergovernmental Agreement Regarding Implementation of the Irondale Gulch Drainage Basin Master Plan*, between Urban Drainage and Flood Control District and the City, County of Denver, and City of Aurora (April 16, 1995): This IGA defines the responsibilities and financial commitments of parties with respect to implementation of mutually beneficial elements of the Irondale Gulch Drainage Basin Plan.

*Intergovernmental Agreement Regarding the Peña Boulevard/E-470 Interchange*, between the City and County of Denver and the E-470 Public Highway Authority (August 22, 1996): This IGA covers topics related to the interchange's design and maintenance, as well as Peña Boulevard lighting.

*40th Avenue Landscaping License Agreement*, between the City and County of Denver and the City of Aurora (June 11, 1998): In this agreement, Denver grants Aurora a license for the purposes of installing, maintaining and repairing landscaping at E. 40<sup>th</sup> Avenue and Airport Boulevard.

*Ordinance No. 364*, An Ordinance Approving a Proposed License Agreement between the City and County of Denver and Sand Creek Metropolitan District Concerning the Use of Property Located at Denver International Airport (May 3, 1999).

*Denver International Business Center Metropolitan District No. 1 Revocable License for a Stormwater Detention Pond*, (December 6, 1999): Specific terms include a one-time payment of \$16,000.00 to the City.

*Intergovernmental Agreement Regarding Implementation of Portions of the First Creek Watershed Master Plan*, between Urban Drainage and Flood Control District and the City, County of Denver, and City of Aurora (January 2, 2001): This IGA defines the responsibilities and financial commitments of parties with respect to implementation of mutually beneficial elements of the Plan.

*Amendment to Intergovernmental Agreement Regarding Implementation of the Irondale Gulch Drainage Basin Master Plan*, between Urban Drainage and Flood Control District and the City, County of Denver, and City of Aurora (January 14, 2002): This amendment deals mainly with ownership of property and limitation of use.

*Amendment to the Parkfield Development Agreement*, by and among Parkfield Partners, LLC, Denver Public Schools, and the City and County of Denver (May 21, 2001): In this agreement the owner agrees to construct a 10-foot-wide segment of the Peña Boulevard trail between 56<sup>th</sup> Avenue and the High Line Trail, with connections to the trail from Airport Way at 53<sup>rd</sup> Avenue, Maxwell Place, the High Line Canal, and a fourth location to be designated. Further, the owner is obligated to construct the Wetland Channel culvert under Airport Way as a condition for development within Superblock N or O. Additional provisions state that Airport Way right of way will be widened to 4 lanes and a 70-foot width with an additional 5-foot detached sidewalk on the west side.

*Sand Creek Metro District Letter Regarding Waiver of Section I.17.C of the Intergovernmental License and Easement Agreement*, dated June 7, 2005 among the cities of Denver and Aurora, Sand Creek Metro District, and Gateway Land LLC; Denver Department of Aviation (May 16, 2006).

*Intergovernmental Agreement Regarding Implementation of the Sand Creek Drainage Basin Master Plan*, between Urban Drainage and Flood Control District and the City, County of Denver, and City of Aurora (August 8, 2006): This IGA defines the responsibilities and financial commitments of parties with respect to implementation of mutually-beneficial elements of the Master Plan.

*Letter Regarding Memorandum of Understanding – Denver/Aurora Shared Streets in Gateway/Green Valley Ranch – Standards, Operations, Maintenance*, from Dave Chambers, City of Aurora, to Bill Vidal, City of Denver (January 30, 2007): This letter outlines the scope of a potential agreement for streets common to the municipalities.

*Amended and Restated Regional Facilities Agreement (RFA)*, between City and County of Denver and Gateway Regional Metropolitan District (January 14, 2008): This agreement replaces the Original RFA.

It includes a table listing the original regional improvements and costs charged to Gateway Regional Metropolitan District. A second table lists anticipated additional regional improvements (to be considered in a regional study), including the frontage road/collector-distributor roadway for the Peña transportation corridor, an interchange in the vicinity of 64<sup>th</sup> Avenue, and East Corridor transit station and related improvements.

*Commerce City, Colorado Fiscal Year 2011 Appropriations Request, Tower Road to Peña Boulevard Interchange On-Ramp*, (March 15, 2010): This document provides background on Commerce City's request for \$1,250,000 from the FY 2011 Department of Transportation; Transportation, Community and Systems Preservation (TCSP) account for the design and engineering of the missing on-ramp to westbound Peña Boulevard from Tower Road.

*Intergovernmental Agreement Regarding FasTracks East Corridor/Denver International Airport*, between the City and County of Denver and RTD (March 16, 2010): This "Aviation IGA" addresses the corridor alignment, non-aviation property in the project area, compliance with other agreements, zoning, coordination with third parties, local agency contribution, coordination on early construction, general design criteria, specific design and construction requirements, design process coordination, construction requirements, AIP/PFCS, permits, construction, business and operations, final inspection and acceptance, operation and maintenance, and betterments and enhancements.

*East Corridor Memorandum of Understanding*, between the Urban Drainage and Flood Control District and the Regional Transportation District (August 31, 2010): This MOU concerns the coordination of design and construction of the FasTracks East Corridor and the Peña Transportation Corridor Pond Mitigations, just north of 40<sup>th</sup> Avenue and east of Tower Road.

*Road Development Agreement*, between ACP DEN 1287 Investors, LLC, and City and County of Denver (January 26, 2011): This agreement is for a Jackson Gap Street extension south to the ACP Property/Harvest Road alignment.

*Intergovernmental Agreement Regarding FasTracks East Corridor/Denver International Airport, First Amendment Full Execution*, between the City and County of Denver and RTD (May 9, 2012): This document amends the March 16, 2010 "Aviation IGA" to address additional gateway station improvements, traffic improvements, drainage improvements, communications improvements, design review and approval, and funding.

*Intergovernmental Agreement for an Operations and Maintenance Plan for Shared Streets*, between the City and County of Denver, the City of Aurora, and the Sand Creek Metropolitan District (September 24, 2012): This IGA outlines an Operations and Maintenance Plan for public streets and associated infrastructure centered on the common corporate boundary.

*Executed Jackson Gap License* between ACP DEN 1287 Investors, LLC, and City and County of Denver (December 31, 2012): This is the executed agreement for the Jackson Gap extension.

# Appendix B – 2040 RTP Projects in the Peña Boulevard Corridor Transportation Study Area

## 2040 RTP Projects in the Peña Boulevard Corridor Transportation Study Area

County	Facility Name	Project Location (Limits)	Improvement Type	Length (Miles)	Staging	Cost (FY '15 \$millions)
Adams	Picadilly Rd	48 <sup>th</sup> Ave to 56 <sup>th</sup> Avenue	Widen from 2 to 6	1.15	2015-2024	\$13,600
Adams	Picadilly Rd	Smith Road to 48 <sup>th</sup> Ave	Widen from 2 to 6	2.16	2015-2024	\$22,500
Adams	Picadilly Rd	I-70 to Smith Road	Widen from 2 to 6	0.54	2015-2024	\$5,300
Adams	Picadilly Rd	56 <sup>th</sup> Ave to 70 <sup>th</sup> Ave./Aurora City Limits	New 6 Lanes	1.69	2015-2024	\$20,400
Adams	Imboden Rd	48 <sup>th</sup> Ave to 56 <sup>th</sup> Ave	Widen from 2 to 6	1	2025-2035	\$10,300
Adams	I-70	Picadilly Rd	New Interchange		2015-2024	\$27,500
Adams	Harvest Mile Rd	I-70 to 56 <sup>th</sup> Ave	New 6 Lanes	4.12	2015-2024	\$54,300
Adams	Harvest Mile Rd	56 <sup>th</sup> Ave to 64 <sup>th</sup> Ave	Widen from 3 to 6	0.99	2025-2035	\$7,800
Adams	64 <sup>th</sup> Ave	Powhaton Rd to Monaghan Rd	New 4 Lanes	0.99	2015-2024	\$6,700
Adams	64 <sup>th</sup> Ave	Himalaya Rd to Harvest Mile Rd	Widen from 2 to 4	2.98	2015-2024	\$12,200
Adams	64 <sup>th</sup> Ave	Harvest Mile Rd to Powhaton Rd	New 2 Lanes	1.02	2015-2024	\$6,500
Adams	64 <sup>th</sup> Ave	Harvest Mile Rd to Powhaton Rd	Widen from 2 to 4	1.02	2025-2035	\$10,900
Adams	48 <sup>th</sup> Ave	Imboden Rd to Quail Run Rd	Widen from 2 to 6	1	2025-2035	\$9,700
Adams	64 <sup>th</sup> Ave	Denver/Aurora City Limit to Himalaya St	Widen from 2 to 6	0.51	2015-2024	\$6,500
Adams	Picadilly Rd	Colfax Ave to I-70	New 6 Lanes	0.31	2015-2024	\$12,900

**2040 RTP Projects in the Peña Boulevard  
Corridor Transportation Study Area  
(Continued)**

County	Facility Name	Project Location (Limits)	Improvement Type	Length (Miles)	Staging	Cost (FY '15 \$millions)
Adams	56 <sup>th</sup> Ave	Picadilly Rd to E-470	Widen from 2 to 6	1.03	2015-2024	\$9,700
Adams	56 <sup>th</sup> Ave	E-470 to Imboden Road	Widen from 2 to 6	7.01	2015-2024	\$67,900
Adams	48 <sup>th</sup> Ave	Powhaton Rd to Monaghan Rd	New 6 Lanes	0.99	2025-2035	\$13,600
Adams	48 <sup>th</sup> Ave	Picadilly Rd to Powhaton Rd	New 6 Lanes	3.02	2015-2024	\$40,700
Adams	Harvest Mile Rd	56 <sup>th</sup> Avenue to 64 <sup>th</sup> Ave	New 3 Lanes	0.99	2015-2024	\$6,500
Adams	Tower/Buckley Rd	105 <sup>th</sup> Ave to 118 <sup>th</sup> Ave	New 4 Lanes	2.02	2015-2024	\$8,800
Adams	96 <sup>th</sup> Ave	Buckley Road to Tower Road	New 2 Lanes	1.13	2012-2014	\$7,700
Adams	96 <sup>th</sup> Ave	Buckley Road to Tower Road	Widen from 2 to 4	1.13	2025-2035	\$17,700
Adams	96 <sup>th</sup> Ave	Tower Rd to Picadilly Rd	Widen from 2 to 6	2.01	2025-2035	\$14,700
Adams	120 <sup>th</sup> Ave	E-470 to Tower Rd	Widen from 2 to 6	0.58	2025-2035	\$4,800
Adams	120 <sup>th</sup> Ave	Tower Rd to Picadilly Rd	Widen from 2 to 6	2.01	2025-2035	\$10,700
Adams	120 <sup>th</sup> Ave	Sable Blvd to E-470	Widen from 2 to 6	1.96	2025-2035	\$29,700
Adams	Buckley Rd	118 <sup>th</sup> Avenue to Cameron Dr	Widen from 2 to 6	1.19	2015-2024	\$13,900
Adams	Picadilly Rd	96 <sup>th</sup> Ave to 120 <sup>th</sup> Ave	New 6 Lanes	3.01	2025-2035	\$49,000
Adams	Tower Rd	Peña Boulevard to 105 <sup>th</sup> Avenue	Widen from 2 to 6	3.78	2015-2024	\$23,200
Adams	Picadilly Rd	82 <sup>nd</sup> Ave to 96 <sup>th</sup> Ave	New 6 Lanes	1.83	2025-2035	\$21,600
Adams	E-470	48 <sup>th</sup> Ave	New Interchange		2015-2024	\$26,900
Adams	E-470	Quebec	New Interchange		2015-2024	\$24,800
Adams	E-470	Potomac	New Interchange		2015-2024	\$8,000

**2040 RTP Projects in the Peña Boulevard  
Corridor Transportation Study Area  
(Continued)**

County	Facility Name	Project Location (Limits)	Improvement Type	Length (Miles)	Staging	Cost (FY '15 \$millions)
Adams	E-470	112 <sup>th</sup> Avenue	New Interchange		2025- 2035	\$17,600
Adams	E-470	88 <sup>th</sup> Avenue	New Interchange		2025- 2035	\$17,600
Adams / Arapahoe	I-70	Harvest Mile Rd	New Interchange		2015- 2024	\$39,600
Adams / Arapahoe	I-70	I-70	Interchange Capacity		2025- 2035	\$185,100
Adams / Denver	E-470	I-70 to Peña Blvd	Widen from 4 to 6	7.43	2025- 2035	\$29,300
Adams / Denver	E-470	Peña Blvd to I-76	Widen from 4 to 6	7.61	2025- 2035	\$51,500
Denver	56 <sup>th</sup> Ave	Peña Blvd to Tower Rd	Widen from 4 to 6	0.72	2015- 2024	\$17,300
Denver	64 <sup>th</sup> Ave	Tower Rd to Denver/Aurora City Limits	Widen from 2 to 4	0.5	2015- 2024	\$700
Denver	Green Valley Ranch Blvd	Chambers Rd to Telluride St	Widen from 4 to 6	1.5	2015- 2024	\$9,900
Denver	Green Valley Ranch Blvd	Chambers Rd to Peña Blvd	Widen from 2 to 4	1.02	2015- 2024	\$2,400
Denver	Green Valley Ranch Blvd	Telluride St. to Tower Rd	Widen from 4 to 6	0.48	2015- 2024	\$1,700
Denver	56 <sup>th</sup> Ave	Himalaya St to Picadilly Rd	Widen from 2 to 6	1	2015- 2024	\$11,600
Denver	Peña Blvd	Tower Road to 78 <sup>th</sup> /75 <sup>th</sup> Ave ramps	Widen from 4/6 to 6/8	2.3	2015- 2024	\$11,400
Denver	Picadilly Rd	70 <sup>th</sup> Ave to 82 <sup>nd</sup> Ave	New 6 Lanes	1.54	2015- 2024	\$11,400
Denver	Tower Rd	38 <sup>th</sup> Ave. to Green Valley Ranch Blvd	Widen from 2/4 to 6	0.44	2015- 2024	\$26,700
Denver	Tower Rd	56 <sup>th</sup> Avenue to Peña Boulevard	Widen from 4 to 6	2.44	2015- 2024	\$16,000
Denver	Tower Rd	48 <sup>th</sup> Ave to 56 <sup>th</sup> Ave	Widen from 4 to 6	1.01	2015- 2024	\$5,300
Denver	Peña Blvd	I-70 to Tower Rd	Widen from 4 to 6	5.15	2015- 2024	\$38,300
Denver	56 <sup>th</sup> Ave	Dunkirk St to Himalaya St	Widen from 4 to 6	0.5	2015- 2024	\$11,500



**2040 RTP Projects in the Peña Boulevard  
Corridor Transportation Study Area  
(Continued)**

County	Facility Name	Project Location (Limits)	Improvement Type	Length (Miles)	Staging	Cost (FY '15 \$millions)
Denver	Peña Blvd	Jackson Gap St. west ramps to DEN Terminal	Widen from 6 to 8	1.71	2015- 2024	\$10,200
Denver	I-70	Brighton Blvd. to I-270	Add 4 new tolled managed lanes		2015- 2024	\$1,175,712
Denver	56 <sup>th</sup> Ave.	Havana St. to Peña Blvd.	Widen 2 to 6 lanes		2015- 2024	\$45,000
Denver	Peña Blvd.	I-70 to E-470	Widen 4 to 8 lanes		2015- 2024	\$55,000
						\$2,417,812
<b>Multimodal projects:</b>						
Adams / Denver	East Rail Line	Denver Union Station to DEN	Commuter Rail	22.8	2015- 2024	\$1,033 (cost includes all lines within Eagle Project)
Adam / Arapahoe	I-225 Rail Line	Parker Rd. to East Rail Line	Light Rail	10.5	2015- 2024	476.9
Adams / Denver	Airport Blvd. & 40th Ave. - Gateway Park	Airport Blvd. & 40th Ave.	Expand Rapid Transit Station with Parking	N/A		
Denver	61 <sup>st</sup> /Peña	East Rail Line between 56 <sup>th</sup> Ave. and 64 <sup>th</sup> Ave.	New Rapid Transit Station with Parking	N/A		
Denver	DEN	DEN	New Rapid Transit Station without Parking	N/A		
Denver	DEN/Peña Blvd.	E-470 to DEN	Proposed Shared Lane Bicycle Route	4.8		
Adam / Denver/ Arapahoe	E-470 Trail	Entire E-470 Corridor	Proposed Paved Multi-Use Trail	41		
Adams / Denver	D-2A/56 <sup>th</sup> Ave.	Chambers Rd. to Picadilly Rd.	Proposed Facility - Separated Sidewalk	5		
Adams / Denver	High Line Lateral Trail	From Memphis St. to High Line Canal Trail	Proposed Multi-Use Trail Connection	2.4		
Adams / Denver	Unknown	Second Creek Trail to Maxwell Place	Proposed Multi-Use Trail Connection	5.1		

## Appendix C – Alternatives Analysis

The initial evaluation to alternative scenario analysis was completed using a risk assessment. In this approach, seven broad criteria were defined that could readily be evaluated for the level of risk that would likely create a fatal flaw for the implementation of a scenario.

The criteria included:

- FAA Support – to what extent does the scenario meet the study objectives and is consistent with FAA financial and operation policies?
- Diversion of Airport Revenues – does the scenario require the use of airport revenues for non-airport purposes?
- Impact on Airport Users – does the scenario introduce new costs or inconvenience to airport users (travelers, employees, etc.)?
- Implementation Complexity – are there complex engineering, construction, or institutional challenges associated with implementing the scenario?
- Financial Complexity – will implementation of the scenario require the participation of multiple parties and/or the introduction of new financial mechanisms?
- Cost Burden to Jurisdictions – will significant contributions from neighboring local jurisdictions be required to implement the scenario?
- Impact on Non-Airport Users – does the scenario introduce new costs or inconvenience to non-airport users (residents, commuters, etc.)?

Table C-1 summarizes the evaluation of the scenarios against the screening criteria. As shown, each scenario presents one or more high risks to implementation. From discussions with the project technical team, the following scenarios were eliminated from further consideration:

- Toll Peña Mainline and Ramps. The negative impact of this scenario on airport users was the primary reason for eliminating this alternative.
- Free E-470 Airport Access. The complexity to implement this scenario was the primary reason for eliminating this alternative.
- Enhanced Regional System. Numerous high risks to the implementation of this scenario, including complexity and cost burden to neighboring jurisdictions, were the primary reasons for eliminating this alternative.

**Table C-1**  
**Screening of Scenarios – Risk Matrix**

Scenario	Fatal Flaw Criteria							Retain Scenario for Detailed Screening ?
	FAA Support (a)	Diversion of Airport Revenue (b)	Impact on Airport Users (c)	Implementation Complexity (d)	Financial Complexity (e)	Cost Burden to Jurisdictions (f)	Impact on Non-Airport Users (g)	
0 - Base Condition (DRCOG 2040 Plan)	<b>High Risk</b>	<b>High Risk</b>	Medium Risk	Low Risk	Low Risk	Low Risk	Low Risk	YES
1 - Base Condition with Defined Cost Sharing Mechanism	Medium	Low	Medium	Low	<b>High</b>	<b>High</b>	Medium	YES
2 - Exclusive Driveway to DEN (close non-airport ramps)	Low	Low	Low	Low	Low	Medium	<b>High</b>	YES
3 - Toll Peña Mainline and Ramps	<b>High</b>	Low	<b>High</b>	Medium	Medium	Medium	<b>High</b>	<b>NO</b>
4 - Toll Peña Ramps	Low	Low	Low	Medium	Medium	Medium	<b>High</b>	YES
5 - Collector-Distributor Roadway	Medium	Low	Low	<b>High</b>	<b>High</b>	<b>High</b>	Medium	YES
6 - Parallel Roadway Corridors	Medium	Low	Low	<b>High</b>	<b>High</b>	<b>High</b>	Medium	YES
7 - Toll Peña Ramps and Free E-470 for Airport Users	<b>High</b>	Low	Low	<b>High</b>	<b>High</b>	Medium	<b>High</b>	<b>NO</b>
8 - Enhanced Regional System	<b>High</b>	<b>High</b>	Medium	<b>High</b>	<b>High</b>	<b>High</b>	Medium	<b>NO</b>

Risk Category	Risk Ranking	Description
(a) <b>FAA Support</b>	High Medium Low	Anticipate FAA will not support Anticipate conditional FAA support/approval Anticipate FAA support/approval
(b) <b>Diversion of Airport Revenue</b>	High Medium Low	Diversion of airport revenue is apparent Potential for diversion of revenue No diversion of airport revenue
(c) <b>Impact on Airport Users</b>	High Medium Low	Significant impact on airport travelers or airport employees Moderate impact on airport travelers or airport employees No/minimal impact on airport travelers or airport employees
(d) <b>Implementation Complexity (practical to build)</b>	High Medium Low	Numerous complex projects are required to implement scenario; multiple phases Projects have moderate complexity & will require successive phases to implement Projects have limited complexity and can be implemented in few phases
(e) <b>Financial Complexity</b>	High Medium Low	High cost scenario requiring contributions from multiple/new funding sources Moderate/high cost scenario requiring several funding/new funding mechanism Moderate cost scenario from established funding sources
(f) <b>Cost Burden to Jurisdictions</b>	High Medium Low	High cost projects requiring significant contributions from local jurisdictions/district/users Moderate cost requiring significant contributions from local jurisdictions/district/users Low cost projects requiring significant contributions from local jurisdictions/district/users
(g) <b>Impact on Non-Airport Users</b>	High Medium Low	Significant impact on non-airport users of Peña Boulevard Moderate impact on non-airport users No/minimal impact on non-airport users

## Final Alternatives for (Future) Detailed Evaluation

The following scenarios were retained for continued consideration:

- Base Condition (DRCOG 2040 Plan)
- Base Condition with Defined Cost Sharing Mechanism
- Exclusive Driveway to DEN (close non-airport ramps)
- Toll Peña Ramps
- Collector-Distributor Roadway
- Parallel Roadway Corridors (Buckley, Tower)

As described in Section 6.2 of this report, DEN is moving forward with a phased program to widen Peña Boulevard from I-70 to the terminal area. The scenarios described above could be implemented to supplement the Peña Boulevard widening plan. Efforts to advance any of these scenarios would include the following work elements:

- Traffic modeling
- Preliminary engineering design plans
- Construction and operations and maintenance (O&M) cost estimates
- Financial plan
- Stakeholder outreach

The evaluation of scenarios that involve tolling of Peña Boulevard requires decisions on a number of unique considerations that are described in Section 5.4.

## Tolling Considerations

**Goal:** For each surviving alternative that includes a tolling component, be able to define:

- Toll facility locations (which ramps, mainline, etc.)
- Basis for the assumed toll rate
- Toll collection scheme (transponder type, detection/camera equipment, etc.)
- Entity to operate/maintain/enforce the toll facilities (including backoffice functions)
- Cost to implement and operate system
- Other?

### **Initial Observations and Approach to Defining the Tolling Alternatives**

#### **Intent of Tolling/Uses of Toll Revenue**

- Collect sufficient toll revenue to offset O&M burden of non-airport users? (This solves short-term funding challenge)
- Collect sufficient toll revenue to offset both O&M and Peña widening cost burden of non-airport users? (This solves long-term funding challenge)



- Offset O&M and Peña widening burden of non-airport users, and also contribute money to neighboring jurisdictions to offset congestion impacts of traffic diverted from Peña Boulevard? Or, any excess cash is returned to Airport operations?
- Set tolls high enough to effectively discourage all non-airport use of Peña?
- Similar questions for alternatives that toll all users of Peña Boulevard

#### Toll Rate Policy

- Flat toll at all ramp toll plazas?
- Toll reflects distance travelled on Peña (GVR lower toll than Tower Rd)? [note: Adams County users would likely pay higher tolls than Denver County users in this scheme]
- Fixed or variable toll (by time of day)?
- What is appropriate detail for this level of study?

#### Traffic Modeling

Run model at a few different toll rates:

- Starting point: pick a ramp toll cost that is reflective of current E-470/NW Pkwy experience
- How much traffic is diverted from Peña?
- Where is traffic diverted to? What is LOS impact to non-Peña roadways?
- What is annual revenue at selected toll rate?

#### Legal Authority

- Confirm the City and County of Denver has existing legal authority to implement tolls on Peña Boulevard.

#### Technology

- All-electronic toll collection system (vehicle transponder and license plate photo) in use on E-470, Northwest Parkway, and CDOT's Express Lane. System is growing in usage and is understood by users.
- As an alternative, DEN could develop its own system, that could involve manned toll booths with cash collection. A proprietary DEN system could also be coupled with an on-airport parking payment system.

#### Operating Entity

- E-470 Public Highway Authority provides back office support for both the Northwest Parkway and the CDOT I-25 HOV/Express Lanes. May be best option for Peña toll accounting functions (if E-470 is willing and is cost-effective)
- Options for operation and maintenance of field equipment (readers, cameras, gantries, communication links) include: E-470, DEN staff, private contractor

#### Off-Airport Uses

Problem: Motorists can exit Peña Boulevard prior to entering the airport limits to access off-Airport uses (airport parking, hotels, other?). Should these users have to pay the toll?



Options:

- **Do Nothing:** In this option, users of off-Airport facilities would pay the same toll as non-airport users. Users can always travel by non-Peña routes to avoid the toll.
- **Additional Detection:** Transponder readers and license plate cameras would be installed at eligible off-Airport facilities. Back office accounting operations would then eliminate the toll charge for these users. Challenge: how to prevent non-airport users from simply driving through an off-Airport facility parking lot to avoid a toll charge.
- **Transponder:** Use a switchable transponder (similar to what US 36 has). May be difficult to enforce.
- **Voucher:** Motorists pay the toll but are provided with a voucher or some other discount from the off-Airport facility operator.
- **Temporary Transponder:** Hotel can provide guests with a temporary transponder to avoid Peña tolls. Guests would still be subject to E-470 tolls.
- **Other:** Investigate if Dulles has similar situation and how it is handled

## Modeling of Toll Alternatives

It is important to note that the toll procedures discussed in this section should not be considered an appropriate methodology for an investment grade toll analysis (e.g. Level 3). Tolling alternatives can be modeled using the existing toll or managed lane procedures in the Focus model. The toll procedures implemented in the Focus model are adequate for regional planning activities and thus, can illustrate how travelers may respond when tolling or fees are assessed to the roadways.

The current version of Focus (February 2016) uses an auto operating cost rate of \$0.20 per mile (in 1996 dollars) for non-tolled freeways (facility type=1) and \$0.12 per mile for tolled freeways. The eight cent per mile discount makes this facility more attractive compared with parallel general purpose facilities. The intention is to capture some of the perceived benefits of toll facilities such as not having to drive under congested conditions, faster travel times, fewer incidents making driving less stressful, etc.

If unique toll facilities are desired, they must be coded into the model network. This can be done by coding a parallel link to the general purpose lanes and coding the planned access and egress links from the general purpose lanes to the toll lanes. If the analysis involves simply changing a general purpose lane to a toll facility, a toll must be directly coded on the roadway links (mainlines and/or ramps). The locations should mimic the approximate locations of where tolls are planned such as any toll plazas, roadway facilities, and ramps. All toll values should be deflated to 1996 dollars which are consistent year dollars used in the Focus model. The appropriate model toll rate should be based on the actual values that may be assessed to drivers. Another option would be to review the toll costs charged for other facilities in the region such as E-470, Northwest Parkway, or the I-25 HOV Express Lanes. Other approaches include testing a range of toll values to determine the number of travelers that are using the facility versus users that are diverted to parallel routes.

## 1. Base Condition (DRCOG 2040 Plan)

Intent/Objective: No restrictions on use of Peña Boulevard mainline or ramps for airport or non-airport traffic.

**Table C-2**  
**Scenario 0 – Base Case (DRCOG 2040 Scenario)**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline per DRCOG 2040 plan: 2 lanes in each direction	X	X	\$65M (const only)	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramp/interchange improvements per DRCOG 2040 plan: Tower Rd on-ramp	X	X	\$3.2M (E-470 reimbursement)	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan: See 2040 RTP table	–	X	\$1.1B	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	–	–	–	–	
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	–	–	–	–	
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	

## 2. Scenario 1 – Base Case (DRCOG 2040 Scenario) with Defined Cost-Sharing

Intent/Objective: No restrictions on use of Peña Boulevard mainline or ramps for airport or non-airport traffic. Local jurisdictions participate in funding Peña improvements.

**Table C-2**  
**Scenario 1 – Base Case (DRCOG 2040 Scenario) with Defined Cost-Sharing**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline per DRCOG 2040 plan: 2 lanes in each direction	X	X	\$65M (const only)	Airport Revenue Funds; DRCOG & match funds; local agency or new improvement district participation	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramp/interchange improvements per DRCOG 2040 plan: Tower Rd on-ramp	X	X	\$3.2M (E-470 reimbursement)	Airport Revenue Funds; DRCOG & match funds; local agency or new improvement district participation	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	—	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan: See 2040 RTP table	—	X	\$1.1B	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	—	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	—	—	—	—	



**Table C-2 (Continued)**  
**Scenario 1 – Base Case (DRCOG 2040 Scenario) with Defined Cost-Sharing**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Inter-governmental Agreements	New agreements with jurisdictions/districts for cost sharing of capital and operations costs for Peña Boulevard	–	–	–	–	
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	

### 3. Scenario 2 – Exclusive Driveway to DEN (close non-airport ramps)

Intent/Objective: Prohibit all non-airport traffic from Peña Boulevard

**Table C-4**  
**Scenario 2 – Exclusive Driveway to DEN**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramps serving non-airport traffic are removed: GVR NB off; GVR SB on; 56 <sup>th</sup> NB off; 56 <sup>th</sup> NB on, Tower EB off; Tower WB on; E-470 EB off; E-470 WB on	X	X	TBD	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	E-470 and/or I-70
Airport Environs Roadway Network	Roadway network improvements per 2040 plan plus additional improvement to serve non-airport traffic diverted from Peña	–	X	\$1.1B + add'l improvements	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements to serve non-airport traffic diverted from Peña
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	–	–	–	–	





**Table C-4 (Continued)**  
**Scenario 2 – Exclusive Driveway to DEN**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	–	–	–	–	
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	

#### 4. Scenario 3 – Toll Peña Boulevard Mainline and Ramps

Intent/Objective: All users of Peña Boulevard would be tolled to support future roadway improvements.

**Table C-5**  
**Scenario 3 – Toll Peña Boulevard Mainline and Ramps**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Toll mainline for airport and non-airport traffic. Widen mainline as needed to maintain LOS C operation	X	X	\$2.7M - \$3.5 (toll equip costs). \$65M widening cost (confirm with modelling)	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
Peña Ramps	Toll ramps for airport and non-airport traffic	X	X	Toll equipment costs included in estimate above	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	—	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, Peña toll revenues, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan plus additional improvement to serve traffic diverted from Peña	—	X	\$1.1B + add'l improvements	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements to serve traffic diverted from Peña
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	—	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	—	—	—	—	
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	—	—	—	—	Pending review of initial IGAs.
Facility Governance	FAA maintains jurisdiction over Peña Boulevard.	—	—	—	—	

## 5. Scenario 4 – Toll Peña Ramps

Intent/Objective: Toll non-airport traffic using Peña Boulevard to minimize demand and congestion

**Table C-6**  
**Scenario 4 – Toll Peña Ramps**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramps serving non-airport traffic are tolled: GVR NB off; GVR SB on; 56 <sup>th</sup> NB off; 56 <sup>th</sup> NB on, Tower EB off; Tower WB on; E-470 EB off; E-470 WB on	X	X	\$1.4M - \$1.8M (toll equip costs)	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan plus additional improvement to serve non-airport traffic diverted from Peña	–	X	\$1.1B + add'l improvements	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements to serve non-airport traffic diverted from Peña
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	–	–	–	–	
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	–	–	–	–	
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	

## 6. Scenario 5 – Collector-Distributor (C-D) Roadway

Intent/Objective: Provide separate roadway system in the corridor for non-airport traffic

**Table C-7**  
**Scenario 5 – Collector-Distributor (C-D) Roadway**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
Peña Ramps	New collector-distributor road system	–	X	\$88M (const only)	Airport Revenue Funds, DRCOG & match funds, C-D toll revenues	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan: See 2040 RTP table	–	X	\$1.1B	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	–	–	–	–	
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	–	–	–	–	
Facility Governance	FAA maintains jurisdiction over Peña Boulevard. City and County of Denver has jurisdiction over C-D system	–	–	–	–	

## 7. Scenario 6 – Develop Parallel Corridors to Peña Boulevard (Buckley, Tower)

Intent/Objective: Provide additional north-south access alternatives to Peña Boulevard to minimize non-airport demand and congestion

**Table C-8**  
**Scenario 6 – Develop Parallel Corridors to Peña Boulevard (Buckley, Tower)**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramps serving non-airport traffic are tolled (or closed): GVR NB off; GVR SB on; 56 <sup>th</sup> NB off; 56 <sup>th</sup> NB on, Tower EB off; Tower WB on; E-470 EB off; E-470 WB on	X	X	\$1.4M - \$1.8M (toll equip costs)	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan plus: Construct Buckley from GVR to 96 <sup>th</sup> Avenues; Widen Tower beyond 2040 plan (to 8 lanes)	–	X	\$1.1B for 2040 plan; Buckley/Tower is \$97M	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements to serve non-airport traffic diverted from Peña
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	





**Table C-8 (Continued)**  
**Scenario 6 – Develop Parallel Corridors to Peña Boulevard (Buckley, Tower)**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	–	–	–	–	Additional development opportunities for new Buckley corridor.
Inter-governmental Agreements	No additional agreements for improvement, operation or funding of facility	–	–	–	–	Potential local agency IGA to implement Buckley
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	

## 8. Scenario 7 – Toll Peña Ramps and Free E-470 Airport Users

Intent/Objective: Toll non-airport traffic using Peña Boulevard to minimize demand and congestion. Airport users would not be charged E-470 tolls (I-70 to Peña Boulevard)

**Table C-9**  
**Scenario 7 – Toll Non-Airport Peña Ramps; Free E-470 Airport Access**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramps serving non-airport traffic are tolled: GVR NB off; GVR SB on; 56 <sup>th</sup> NB off; 56 <sup>th</sup> NB on, Tower EB off; Tower WB on; E-470 EB off; E-470 WB on	X	X	\$1.4M - \$1.8M (toll equip costs)	Airport Revenue Funds, DRCOG & match funds, Peña toll revenues	Peña improvements eligible for DRCOG funds. Peña ramp tolls would be implemented by E-470 Authority and E-470 would retain all tolls.
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	—	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	Additional technology to allow for rebate of E-470 tolls to airport users not included in const cost estimate.
Airport Environs Roadway Network	Roadway network improvements per 2040 plan plus additional improvement to serve non-airport traffic diverted from Peña	—	X	\$1.1B + add'l improvements	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements to serve non-airport traffic diverted from Peña
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	—	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	



**Table C-9 (Continued)**  
**Scenario 7 – Toll Non-Airport Peña Ramps; Free E-470 Airport Access**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Financial/Institutional Elements						
Land Use Management	2040 DRCOG plan. No DEN Real Estate or Aerotropolis development in excess of DRCOG plan (Airport City development for 2040 is 7,500 employees)	—	—	—	—	
Inter-governmental Agreements	Agreement with E-470 to collect (and keep) Peña ramp tolls. No tolls collected from airport users on E-470 (I-70 to Peña)	—	—	—	—	Determine if Peña toll collection would offset free tolls for airport users on E-470
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	—	—	—	—	

## 9. Scenario 8 – Regional System

Intent/Objective: Multiple improvements to regional transportation system. Provide new arterial access to DEN terminal area and other on-airport uses to reduce dependence on Peña Boulevard as sole driveway.

**Table C-10**  
**Scenario 8 – Regional System**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Physical/Operational Elements						
Peña Mainline	Widen mainline as needed to maintain LOS C operation	X	X	TBD	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
Peña Ramps	Ramp/interchange improvements per DRCOG 2040 plan	X	X	TBD	Airport Revenue Funds, DRCOG & match funds	Peña improvements eligible for DRCOG funds
E-470 and/or I-70	Mainline and interchange improvement per 2040 plan: Widen E-470 from 4 to 6 lanes; new interchange at E-470/48 <sup>th</sup> Ave	–	X	\$56.2M (2040 RTP for E-470)	DRCOG & match funds, E-470 tolls, HPTE (I-70)	
Airport Environs Roadway Network	Roadway network improvements per 2040 plan, plus additional network enhancements: New DEN connections at Harvest Rd (from south), Powhatan Rd (from south), Hudson Rd (from south), 72 <sup>nd</sup> Ave (from east), 88 <sup>th</sup> Ave (from east), 96 <sup>th</sup> Ave (from east), Hayesmount Rd (from north), Powhatan Rd (from north), Gun Club Road (from north), 104 <sup>th</sup> Ave (from west), 88 <sup>th</sup> Ave (from west).	–	X	\$1.1B + add'l improvements	DRCOG & match funds, developer funds, local CIP funding , improvement district	Need supplemental funding source for additional network improvements
Multimodal Elements	Transit/Ped/Bike improvements per 2040 plan: Peña Blvd multi-use trail; E-470 multi-use trail	–	X	TBD	DRCOG & match funds, developer funds, local CIP funding , improvement district	



**Table C-10**  
**Scenario 8 – Regional System**

Major Elements	Required Improvement	Financial Resp'y		Concept-level Cost	Candidate Funding Sources	Notes
		DEN	Others	(2015 \$)		
Financial/Institutional Elements (Continued)						
Land Use Management	2040 DRCOG plan. Potential DEN Real Estate or Aerotropolis development in excess of DRCOG plan	–	–	–	–	
Inter-governmental Agreements	New intergovernmental agreements for funding improvements in excess of 2040 RTP improvements	–	–	–	–	
Facility Governance	No change in governance. FAA maintains jurisdiction over Peña Boulevard.	–	–	–	–	



## Appendix D – Tower Road On-Ramp Cost Sharing Strategy

Tower Road Ramp Agreement Amendment Presentation  
Prepared by: Denver International Airport  
April 14, 2015

### Background

- 1992: IGA between City & County of Denver and Commerce City provided for construction and funding of the two east side ramps at the Tower Rd. and Peña Boulevard interchange
  - Denver agreed to future expansion of two additional ramps to complete interchange
- 1999: Third ramp (off-ramp from eastbound Peña Boulevard. to Tower Rd.) was built by Denver Public Works
  - Adjacent private property owners contributed funding
- Today: Proposed amendment to 1992 IGA to provide for fourth and final ramp

### New Tower Rd. On-Ramp to Peña Blvd

- Commerce City seeks to build 4th ramp (Tower Road to westbound Peña Boulevard) as part of Tower Rd. widening project and agrees to:
  - Design/construct new on-ramp in accordance with terms of IGA amendment
  - Get approval from DEN, Public Works and FAA on alignment
  - Secure a license for use of DEN property prior to beginning work
- Denver shall have no responsibility for construction costs of new on-ramp
  - Funding being provided by the E-470 Public Highway Authority
- DEN and Public Works will participate in technical and environmental reviews

### Relationship to Peña Blvd Corridor Study

- DEN undertaking traffic study to assess current and future use of Peña Boulevard
  - Study will examine alternatives to address non-Airport traffic demand and funding for Peña Boulevard
- FAA advised that a temporary funding mechanism must be established to fund:
  - Maintenance of new ramp
  - Maintenance of Peña Blvd section impacted by increased non- Airport traffic, due to new on-ramp



- Permanent funding solution to be identified upon completion of the Peña Blvd. Corridor Transportation Study

#### Temporary O&M Funding Required by FAA for Non-Airport Traffic

- Commerce City will compensate DEN annually for variable maintenance costs attributable to non-Airport and non-Denver traffic using new on-ramp and impacted Peña Blvd. segment:
  - New On-Ramp: Tower Rd. to Peña Blvd. - 0.5 lane miles
  - Peña Boulevard Segment: Westbound Peña Blvd. from about Tower Rd. to 56th Avenue - 5.44 lane miles

#### Commerce City Estimated Payments for Non-Airport Traffic

- Payment schedule included in IGA amendment for first five years (2016 – 2020)
  - Roughly \$26,000 per year
- DEN to provide Commerce City with annual accounting of actual maintenance costs attributable to non-Airport traffic
  - Difference between actual and estimated will be reconciled
- Commerce City also will compensate DEN for major maintenance (slab replacement) for non-Airport and non-Denver traffic
- Denver General Fund will compensate Airport Enterprise Fund for Denver's portion of non-Airport traffic (roughly 20% or \$6,500 per year)

#### Temporary Nature of Agreement Amendment

- Payment obligations in IGA Amendment are temporary, to be obviated and superseded by comprehensive approach identified by Peña Boulevard Corridor Transportation Study
- Upon adoption of comprehensive approach, Parties shall negotiate a further amendment
- If no comprehensive approach is adopted within five years of execution, Parties will evaluate Amendment and consider revisions to existing payment obligations

Denver International Airport, Airport Infrastructure Management (AIM)  
Prepared by: Brandon Howes, AICP, Senior Landside Planner  
December 24, 2014

### **Draft Proposed Methodology for 2014 Tower Rd. On-Ramp Jurisdictional Contributions**

*Assumptions (all numbers in \$2014)*

- Annual Maintenance Costs related to Non-Airport Traffic on Peña Blvd. from Tower Rd. to 56<sup>th</sup> Ave. - \$126,510<sup>2</sup>
- Annual Slab Replacement Costs related to Non-Airport Traffic on Peña Blvd. from Tower Rd. to 56<sup>th</sup> Ave. - \$173,265<sup>3</sup>
- Percentage of Non-Airline Traffic attributable to Commerce City – 15.44%<sup>4</sup>
- Percentage of Non-Airline Traffic attributable to City and County of Denver – 16.2%<sup>5</sup>

#### **Maintenance Costs for segment of Peña Blvd. between 56<sup>th</sup> Ave. and Tower Rd.<sup>5</sup>**

- Commerce City Maintenance Costs Contribution-  $\$126,510^1 * 15.44\%^3 = \$19,533$
- City and County of Denver Maintenance costs contribution:  $\$126,510^1 * 16.2\%^4 = \$20,495$
- Other Jurisdiction maintenance costs contribution (including Denver):  $\$126,510^1 - \$19,533 = \$106,977$

#### **Slab Replacement Costs for segment of Peña Blvd. between 56<sup>th</sup> Ave. and Tower Rd.<sup>6</sup>**

- Commerce City slab replacement contribution-  $\$173,265^2 * 15.44\%^3 = \$26,752$
- City and County of Denver slab replacement contribution:  $\$173,265^2 * 16.2\%^4 = \$28,068$
- Other Jurisdiction slab replacement contribution (including Denver):  $\$173,265^2 - \$26,752 = \$146,513$

#### **Total 2014 Annual Costs for segment of Peña Blvd. between 56<sup>th</sup> Ave. and Tower Rd.**

- Commerce City =  $\$19,533 + \$26,752 = \$46,285$
- City and County of Denver =  $\$20,495 + \$28,068 = \$48,563$
- All non-Commerce City costs =  $\$106,977 + \$146,513 = \$253,490$

**Commerce City & Other Jurisdiction costs will increase over time. City & County of Denver costs will decrease over time.**

<sup>2</sup> Oliver Wyman p. 5- Updated to 2014 numbers assuming 3% annual inflation.

<sup>3</sup> Oliver Wyman p. 5- Updated to 2014 numbers assuming 3% annual inflation

<sup>4</sup> FHU Origin/Destination Memo p.2- Traffic percentages updated to 2014 estimate

<sup>5</sup> FHU Origin/Destination Memo p.2- Traffic percentages updated to 2014 estimate

<sup>5</sup> Portion of Maintenance costs considered to vary with traffic volumes. Follows Commerce City's proposed Dec. 2014 methodology.

<sup>6</sup> Portion of Slab Replacement costs considered to vary with traffic volumes. Included based on FAA recommendation.



## Appendix E – FAA Policy Letter



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Office of the Associate Administrator  
for Airports

800 Independence Ave., SW.  
Washington, DC 20591

APR 28 2016

Ms. Kim Day  
Chief Executive Officer  
Denver International Airport  
8500 Pena Boulevard  
Denver, CO 80249

Dear Ms. Day:

Thank you for your February 2 letter to Administrator Huerta about Denver International Airport's (DEN) authority to use airport revenue to maintain and expand Peña Boulevard. As you know, Peña Boulevard is an important roadway, which connects travelers to the airport. It is located on airport property and was originally constructed for dedicated airport access. We acknowledge that Denver, the surrounding communities, and DEN have experienced significant growth from the time that Peña Boulevard was originally constructed. This growth, while very positive, has impacted the service level of Peña Boulevard and has called into question past funding practices for the maintenance and long-term capital construction costs.

Your letter provided new traffic data completed in 2016 that had not previously been provided to the Federal Aviation Administration (FAA) for review. The new data showed that service levels would decrease due to airport-related traffic on certain segments of Peña Boulevard from service level C to D in 2025, as opposed to 2035 as referenced in the traffic study DEN completed in 2012. You also provided three possible options for FAA to consider regarding the 2016 data and the impacts it might have on past statutory interpretation and FAA policy decisions. The options were:

- (i) based on its unique history and operating condition for many years, Peña Boulevard can be characterized as part of "the airport" that may be supported with airport revenue;
- (ii) based on the high percentage of airport-related traffic, Peña Boulevard can be characterized as a local facility that is directly and substantially related to the air transportation of passengers or property; or
- (iii) based on the airport-related benefits of expanding Peña Boulevard, DEN can use airport revenue to fund the full or prorated costs of expansion.

After careful consideration of the proposals in your letter, meetings between DEN and FAA staffs, as well as additional information from DEN, we have made several determinations.



The first two options would require a significant departure from the FAA's interpretation of Federal statute and the Airport Revenue Use Policy. The considerable volume of nonairport-related traffic on certain segments of Peña Boulevard continues to preclude us from considering these as viable options.

The third option, more specifically, the request to fund maintenance and capital costs on a prorated basis, warrants further discussion. We will continue to assist DEN as you refine the data from your 2016 traffic study. We will also analyze impacts to any proposals you put forward on the proration of costs associated with Peña Boulevard.

The FAA will continue to work with you to explore how airport revenue might be used in support of Peña Boulevard in a manner consistent with both Federal law and FAA policy. If you have questions or would like to discuss further, please contact Randy Fiertz, Manager of the FAA's Northwest Mountain Region Airports Division, at (425) 227-2609 or John Bauer, Manager, Denver Airports District Office, at (303) 342-1259.

I trust this information is helpful.

Sincerely,

Eduardo A. Angeles  
Associate Administrator  
for Airports

*We'll work hard  
to find the best  
way forward.*